



Selected Appropriate Technologies for Developing Countries

abstracts from the NTIS Data Files



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Issue Number 1

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16. Abstract (Limit: 200 words) This bibliography is an edited search of "appropriate technology" citations from the NTIS Bibliographic Data File. Over 1000 citations with abstracts are included. Appropriate technology is defined as small-scale, employment-generating, and energy-conserving technologies relevant to the needs and resources of developing countries. Also, the concept implies a humanistic approach to problem solving and considers "soft technologies," such as education, health care delivery, and community development.				
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Department of Commerce

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DEPARTMENT OF STATE
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WASHINGTON, D.C. 20523

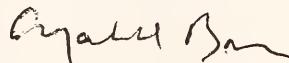
Dear Colleague:

The Bureau for Latin America and the Caribbean of the Agency for International Development is proud to introduce this first in a series of appropriate technology bibliographies produced by the National Technical Information Service (NTIS) of the Department of Commerce. This publication, entitled Selected Appropriate Technologies for Developing Countries, grows out of a regional project, "Science and Technology Information Transfer", and represents a cooperative effort by AID and NTIS with the collaboration of Volunteers in Technical Assistance (VITA).

The purpose of the guide is to identify information on appropriate technology existing in the vast NTIS computerized data file. Technologies identified herein are small-scale, employment-generating and energy-conserving. We trust they will be found to be relevant to the needs and available resources of the poor of developing countries.

All information listed is available through NTIS and will receive wide dissemination through the AID/NTIS international information network. We hope that you will find the bibliography a useful reference guide and that this information will contribute to the solving of local development problems in Latin America and the Caribbean.

Sincerely,



Marshall D. Brown
Associate Assistant Administrator
for Development Resources
Bureau for Latin America and
the Caribbean

About NTIS

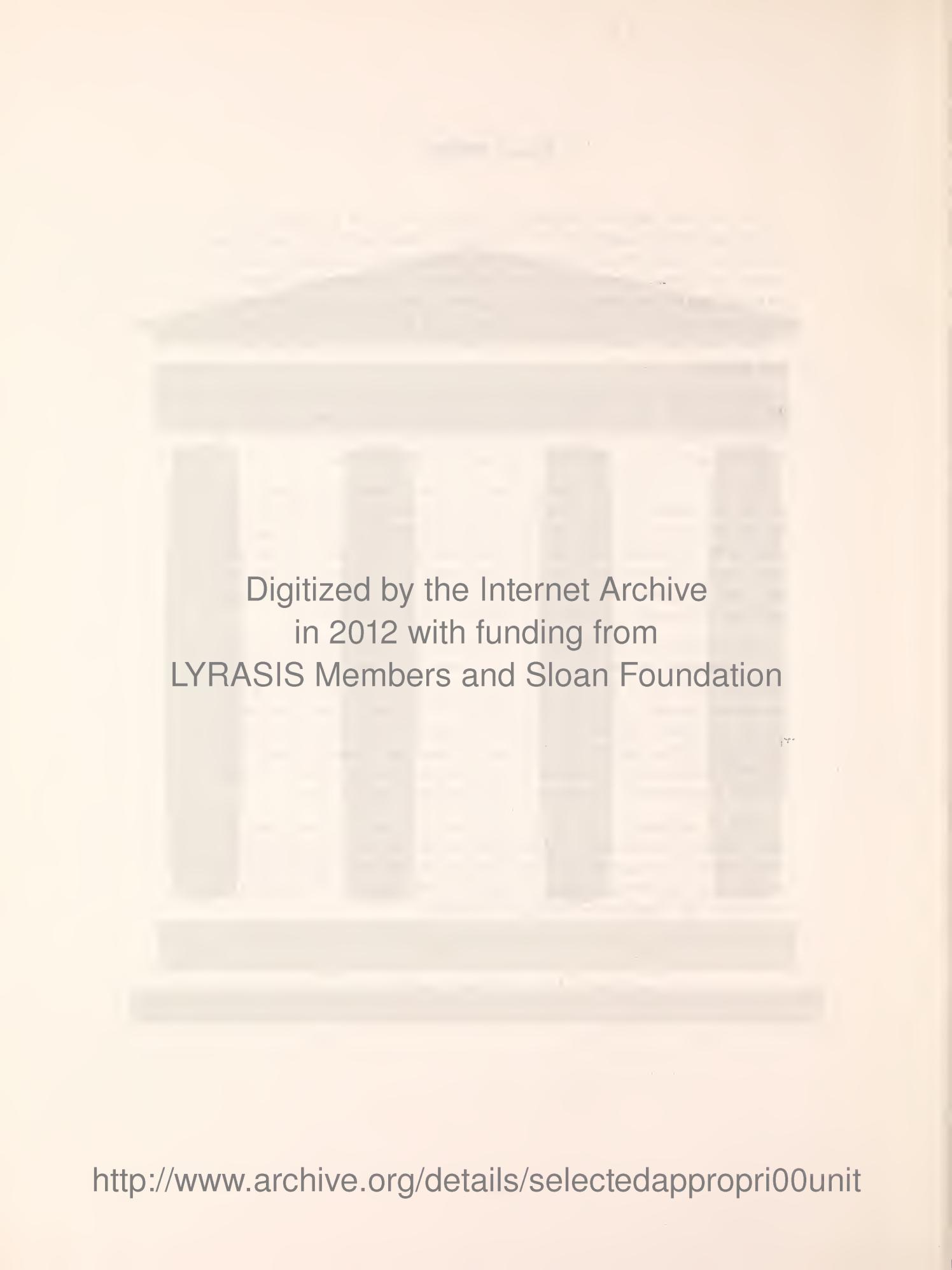
The National Technical Information Service (NTIS) is an agency within the United States Department of Commerce dedicated to the international exchange of scientific and technical information. It is the largest clearinghouse and dissemination network of the U.S. Government-sponsored research and development, but it also draws upon other public and private information sources throughout the world. The NTIS collection exceeds 1 million titles, with over 150,000 documents from sources outside the United States.

As a part of a new initiative to aid economic development, NTIS, under the sponsorship of the U.S. Agency for International Development, has become actively involved in the acquisition and dissemination of appropriate technology information for developing countries.

This joint NTIS/AID international program already consists of a worldwide information network. Some 30 cooperating agencies in developing countries around the world collect AT information, put the documents into the NTIS system, and use NTIS services to meet their own development needs. NTIS network has become a major clearinghouse for the two-way flow of appropriate technology information; a worldwide sharing of technical information which will continue to grow in the future.

NTIS operates as a public service to store and channel technical information appropriate to the user needs. Information in the public domain is collected and stored. Bibliographic data are maintained on-line and comprehensive listings of all documents in the NTIS collection are printed. The public may quickly locate summaries of interest using on-line search or by consulting various published searches prepared by information specialists at NTIS. The desired documents (in full text) can then be ordered in paper-copy or microfiche by filling out the appropriate request form.

NTIS is obligated by the U.S. Congress to recover its operating costs from the sale of documents. The storage and distribution of the technical information is a self-supporting public service, sustained by its national and international customers. Please consult the order form in the back of this publication for complete ordering information.

A very faint, blurry background image showing what appears to be a row of bookshelves in a library or archive. The shelves are filled with books, though they are out of focus.

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HOW TO USE

Abstract Entry

Order/accession number.	PB-239 100/1CP	PC A12/MF A01	Price codes: PC means paper copy; MF, microfiche. Consult current code-price table for actual prices.
This number must be used to order NTIS products	Bechtel, Inc., San Francisco, Calif. Path to Self-Sufficiency Directions and Constraints. Appendices Final rept. on Phase 1. Aug 74, 267p* Rept no. BECHTEL-10900-74-43-I-App Grant NSF-C867		
Corporate author			Title of document
Keywords — used for indexing and searching	Descriptors: *Energy supplies, *Computer programs, Crude oil, Natural gas, Coal, Oil shale, Uranium, Thorium, Bituminous sands, Hydroelectric power generation, Geothermal prospecting, Solar energy conversion, Wastes, Systems analysis, Systems engineering, Capitalized costs, Fossil fuel deposits, Transportation, Planning, Forecasting, Algorithms, Flow charting, Mathematical models, FORTRAN.		
	A computer program that calculates resource requirements and summarizes results for any fuel mix is presented. The program tabulates an annual schedule of required facilities to be brought on-line and attendant annual schedules of capital (2 classes), manpower (4 types), and materials (9 categories) requirements. The model is exercised for two likely fuel mixes and the implications in terms of anticipated capital, manpower, and materials constraints are discussed.	Abstract of document	

Subject Index Entry

Subject Term.—These are arranged in alphabetical sequence in the Index	ENERGY SUPPLIES	
	Energy System Network Simulator (ESNS). ii. A	Title
	User's Guide BNL-20979	9B
	Path to Self-Sufficiency Directions and Constraints PB-239 099/5CP	
	Path to Self-Sufficiency Directions and Constraints PB-239 100/1CP	21D
	An Economic Analysis of Declining Petroleum Supplies in Texas: Income, Employment, Tax and Production Effects as Measured by Input-Output and Supply-Demand Simulation Models PB-243 320/9CP	08I

Order number. Documents in the abstract section are sequenced alphanumerically by this number.

Corporate Author Index Entry

Corporate author	BECHTEL, INC., SAN FRANCISCO, CALIF.	
Order/accession number	BECHTEL-10900-74-43-I-App Path to Self-Sufficiency Directions and Constraints PB-239 099/5CP	Title
	Path to Self-Sufficiency Directions and Constraints. Appendices PB-239 100/1CP	21D

SELECTED APPROPRIATE TECHNOLOGIES

- AD-A002 212/9** PC A02/MF A01
Rand Corp Santa Monica Calif
Fuel from Organic Matter: Possibilities for the State of California
Doris J. Dugas. Oct 73, 20p Rept no. P-5107

Descriptors: *Energy conversion, *California, *Fuels, Methane, Organic materials, Forests, Farm crops, Wastes(Industrial), Solid wastes, Urban areas, Quantities, Cost estimates, Industries, Food processing, Lumber, Sewage.
Identifiers: Agricultural wastes, Waste disposal, *Solid waste disposal, Refuse.

This study investigates the amounts of organic material that might be made available for energy purposes in the State of California, its potential fuel value, and the estimated cost. Sources of organic material that are considered are: (1) crops grown specifically for energy, (2) natural forests, and (3) wastes from the urban, agricultural, and industrial sectors.
- AD-A003 909/9** PC E02/MF A01
Naval Research Lab Washington DC
Corrosion of Metals In Tropical Environments: Part 10 - Final Report of Sixteen-Year Exposures
Final rept.
C. R. Southwell, and J. D. Bultman. 2 Jan 75, 41 Rept no. NRL-7834
See also Part 9, AD-687 705.

Descriptors: *Corrosion, *Tropical tests, Sea water, Fresh water, Tables(Data).

A comprehensive long-term investigation of corrosion of 52 metals immersed in seawater and in fresh water, suspended at mean-tide level, and exposed to marine and inland tropical atmospheres has been completed for exposure periods of up to 16 years. A series of reports on specific metal groups has already been published. This is a final report on the project; it presents tabulated results for all metal-environment combinations included in the study, both for simple plates and bimetallic couples. Many of these are previously unreported data. Time-corrosion curves for all single-metal exposures not previously reported on to completion are included; these are for 16 wrought and cast ferrous metals in two atmospheres and 7 nonferrous metals in all five environments. Because of their basic value for comparing corrosiveness of environments and for evaluating effectiveness of alloys, curves for all the commercially pure metals are presented for all five environments. The final steady-state corrosion rate is a most useful value for estimating expected metal life; this value (R sub c) has been established for most metals in each environment and is included with all curves and tabulated data.
- AD-A004 254/9** PC A05/MF A01
Naval Postgraduate School Monterey Calif
Factors Effecting the Fatigue Strength of Ferro-Cement
Master's thesis
David P. Sargent, Jr. Dec 74, 89p

Descriptors: *Reinforced concrete, *Fatigue(Mechanics), Wire, Orientation(Direction), Impregnation, Cements, Fatigue tests(Mechanics), Stresses, Theses.
Identifiers: *Ferrocement.

Ferro-cement is a composite material consisting of multiple layers of wire mesh impregnated with a cement mortar. Steel rods may be sandwiched in the center to give added strength, and to shape the mesh before application of the mortar. Selection of materials can vary considerably. Investigation of the influence of wire orientation on the fatigue strength of ferro-cement was undertaken in this study. Tests were also conducted to determine the effect on fatigue life of voids in the specimens caused by poor penetration of the mortar.
- AD-A008 453/3** PC A04/MF A01
Asian Inst of Tech Bangkok (Thailand)
The Reclamation of Drinking Water from Sewage
Annual rept. 1 Jan-31 Dec 72

M. G. McGarry. 4 Feb 75, 74p ARDG(FE)-472-2 Grant DA-RDRF-S92-544-72-G181

Descriptors: *Water treatment, *Drinking water, *Water reclamation, Waste water, Arid land, Nitrogen, Algae, Photosynthesis, Activated carbon, Filtration, Thailand.
Identifiers: *Waste water reuse, Potable water, Chemical removal(Water treatment), Harvesting of algae, Aeration ponds, Lagoons(Ponds), Activated carbon treatment, Water pollution control.

Indirect reuse of wastewaters in drinking water supplies is common practice in industrialized states today. The investigations reported upon have been directed towards improvements upon existing techniques more applicable to the tropical and savanna developing country. High costs and technical difficulties have been encountered in the removal of nitrogen and low level organics. In this study, investigations have been conducted into nitrogen stripping by photosynthetic algal growth, using the nitrogen as nutrient with subsequent algae harvest from ponds, and low level organics reduction by (a) powdered activated carbon treatment and (b) semi-rapid filtration. Several processes including high rate treatment oxidation ponds, dissolved air flotation, roughing filtration, photosynthetic nitrogen stripping ponds, powdered activated carbon adsorption, dual-media filtration and chlorination were developed and specifically applied to domestic wastewater reclamation for drinking water. These were incorporated into two process streams, one using activated carbon for low level organics removal and the other semi-rapid filtration.
- AD-A010 976/9** PC A03/MF A01
Rand Corp Santa Monica Calif
A Housing Services Policy for Low-Income Urban Families in Underdeveloped Countries
Georges Vernez. Dec 74, 26p Rept no. P-5328

Descriptors: *Housing(Dwellings), *Underdeveloped areas, *Nations, Marketing, Policies, Construction, Urban areas, Finance, Management planning and control, Classification.
Identifiers: *Developing countries, *Squatter communities, Services, Low income families.

Housing policies for urban low-income families in underdeveloped countries have typically stressed the public supply of fully serviced standard housing units, but these policies are mostly unsuccessful. In practice, a large proportion of the demand for shelter has been overflowing into so-called squatter settlements that are developing at the periphery of most large sized cities of the emerging nations. The paper discusses a housing services policy which promises to be effective for these families. The financial component of the policy is studied.
- AD-A013 482/5** PC A05/MF A01
Naval Postgraduate School Monterey Calif
The Effects of Precycling on the Strength of Ferrocement
Master's thesis
Earle Stanley Babcock. Jun 75, 90p

Descriptors: *Reinforced concrete, *Fatigue(Mechanics), Fatigue tests(Mechanics), Wire, Stresses, Cyclic tests, Tensile properties, Bending stress, Theses.
Identifiers: *Ferrocement.

Ferrocement is a composite material made up of cement mortar reinforced with a mesh of steel wire. Its non-homogeneity results in material characteristics which are peculiarly its own. In this study, the ferrocement specimens tested varied in the type of wire reinforcement used, as well as in the water content of the mortar. Stress versus cycles to failure curves were developed, and comparisons were made between the curves of different types of specimens. Bending and tensile strength tests were conducted after cyclic loading in order to gain insights on the effects of precycling. Finally, some comparisons were made which related the data from this thesis to that of several preceding studies.
- AD-A015 426/0** PC A08/MF A01
Army Tropic Test Center Apo New York 09827
Materiel Testing In the Tropics
4th ed.
Jun 75, 167p Rept no. USATTC-7503001

Descriptors: *Environmental tests, *Tropical regions, *Materiel, Handbooks, Degradation, Climate, Computerized simulation, Geology, Vegetation, Biodegradation, Herbicides, Elastomers, Plastics, Textiles, Electronic equipment, Optical equipment, Leather, Acoustics, Human factors engineering, Seismology, Radio transmission, Ground vehicles, Panama.
Identifiers: Canal zone.

The US Army Tropic Test Center (USATTC) presents the 1975 update of Tropic Environmental Effects, retitled Materiel Testing in the Tropics. The handbook is a compendium of the US Army's experience in testing equipment in the humid tropics. Sources of information are tropic materiel tests, test methodology investigations, personal experiences, open literature, Department of Defense reports, and voluntary contributions from many scientists and engineers outside of USATTC. The document is the US Army's unofficial corporate memory of tropic materiel testing. Topics covered include the Panama Canal Zone environment, history of tropic tests, degrading environmental factors, materiel degradation, tropic reliability and maintainability, vehicular mobility testing, sound, visibility, and radio propagation, human factors engineering, working in the jungle, man-pack portability and computerized test site selection methods.
- AD-A026 264/2** PC A08/MF A01
Air Force Inst of Tech Wright-Patterson AFB Ohio
Solid Waste Management - Tomorrow's Alternatives in the Urban-Rural Environment
Master's thesis
Ronald J. Weeden. 1975, 161p Rept no. AFIT-CL-76-44

Descriptors: *Waste disposal, *Management planning and control, Regulations, Legislation, Materials recovery, Economic analysis, Collecting methods, Shredding, Incinerators, Fuels, Packaging, Theses.
Identifiers: *Solid waste disposal, *Waste recycling, Waste transfer stations, Sanitary landfills, Composts.

Solid wastes collection and disposal problems are enormous and inadequacies are not only polluting our land, air, and water, but are precipitating social, economic, and political problems as well. It is assumed that any design for solid waste management must include resource recovery as an integral part of the system, but only within the limits of cost/benefit advantages and, equally important, within the limits of developing markets for recovered materials. Viable alternatives are documented for solving the immediate problem and integrating the capability for conserving precious resources by enhancing the following objectives: (1) Improve efficiencies; (2) Enhance satisfaction; (3) Increase local knowledge and information; and, (4) Economically recover and process materials.
- AD-A029 823/2** PC A02/MF A01
Army Engineer Waterways Experiment Station Vicksburg Miss
Research and Development of Fiber-Reinforced Concrete in North America
Final rept.
George C. Hoff. Feb 74, 19p Rept no. WES-MP-C-74-3
Presented at Symposium on Concrete Research and Development (1970-1973) Sep 73, Sydney, Australia.

Descriptors: *Reinforced concrete, *Concrete, *Fiber reinforcement, Reinforcing materials, Steel, Glass, Plastics, Fibers, Spallation, Impact strength, Flexural properties, Metal fibers, Glass fibers, Glass textiles.
Identifiers: Mortars(Material), Ferrocement.

Fiber-reinforced concrete (FRC) in North America is emerging from the laboratory and is finding many potential applications. Steel, glass, and plastic fibers are being used in mortars and concretes

SELECTED APPROPRIATE TECHNOLOGIES

to improve the characteristics of these materials, particularly the flexural and impact strengths. Steel-FRC is being used mostly for pavement overlays. Glass-fiber-reinforced cements are being used in architectural products. Plastic-fiber-reinforced products are being used for improved spall and impact resistance. The applications of FRC are limited only by the ingenuity of the user. (Author)

AD-A029 842/2 PC A02/MF A01
Army Engineer Waterways Experiment Station
Vicksburg Miss
Bamboo Reinforced Concrete

Miscellaneous paper
Helmut G. Geymayer, and Frank B. Cox. Jan 70, 19p Rept no. WES-MP-C-70-2
See also Rept. no. AEWES-TR-C-69-C-1 dated Feb 69, AD-685 824.

Descriptors: *Concrete, *Reinforced concrete, *Reinforcing materials, *Fiber reinforcement, Bonding, Deformation, Shrinkage, Flexural strength, Cracking(Fracturing), Deflection, Strength(Mechanics).
Identifiers: *Bamboo.

Military construction activities in Southeast Asia have caused renewed interest in bamboo reinforcement and an investigation of the use of bamboo as expedient reinforcement for concrete was begun at the U. S. Army Engineer Waterways Experiment Station. The more important results and conclusions are summarized here.

AD-A032 835/1 PC A06/MF A01
Army Engineer Waterways Experiment Station
Vicksburg Miss

Expedient Reinforcement for Concrete for Use in Southeast Asia. Report 3. Additional Tests of Bamboo

Frank B. Cox, and James F. McDonald. Dec 70, 101p Rept no. WES-TR-C-69-3-3
See also Report 2, AD-706 846.

Descriptors: *Reinforced concrete, *Reinforcing materials, Plants(Botany), Preparation, Loads(Forces).
Identifiers: *Bamboo, *Bamboo reinforcement.

This report summarizes the to-date (October 1969) results of a current WES study on the feasibility of using bamboo as an expedient reinforcement for temporary reinforced concrete structures. The report contains the results of an investigation of the most important engineering properties of an Asian species of bamboo (*Phyllostachys bambusoides* or *Madake*), some additional properties (since the publication of Report 1) obtained for the local Mississippi cane (*Arundinaria tecta*), description of short-time static tests conducted on 14 beams, description of tests of two beams subjected to sustained loading, conclusions, and tentative, to-date recommendations for the design of bamboo-reinforced members.

AD-A036 072/7 PC A08/MF A01
Army Engineer Waterways Experiment Station
Vicksburg Miss

Proceedings, Research Planning Conference on the Aquatic Plant Control Program. 22-24 October 1975, Charleston, S.C.

Final rept.
Dec 76, 160 Rept no. WES-MP-A-76-1

Descriptors: *Weed control, *Aquatic weeds, *Herbicides, *Biological control, Aquatic plants, Conferences, State law, Pathogenic materials, Fishes, Streams, Inland waterways, Lakes, Aquatic organisms, Microorganisms, Water hyacinth, Rubber, Biodeterioration, Release mechanisms, Subtropical regions, United States, South America, Mexico.
Identifiers: White amur fishes, 2-4-D herbicides, Silvex, *Biological weed control.

Partial Contents: Status of Classification of Aquatic Herbicides; Aquatic Herbicide Tolerance; State Certification of Aquatic Herbicide/Pesticide Operations in Florida, Georgia, Texas, Oklahoma, and Arkansas; Aquatic Plant Problems in Puerto Rico; Reconnaissance Survey of Aquatic Weed Infesta-

tions in Lakes and Navigable Streams in Oklahoma; South American Field Studies of Prospective Biocontrol Agents of Weeds; Aquatic Weed Problems in Mexico and Texas and Some Measures for Control; Possible Effects of the Introduction of the White Amur into Lake Conway, Fla.; Aquatic Weed Versus Plant Pathogen - A study of a biological control in action; Controlled Release Herbicides-Rubber formulations; 2,4-D in Slow-Moving Water; Extensive Degradation of Silvex by Synergistic Action of Aquatic Microorganisms; Integrated Control of Waterhyacinths with Four Biological Agents; Waterhyacinths-Nuisance of Benefit; and Large-Scale Field Test with the Monosex White Amur in Florida.

AD-A038 482/6 PC A07/MF A01
Michigan Univ Ann Arbor Dept of Geography
Urban Food Supply and Distribution: Characteristics and Utilization of Fresh Food Markets in Bangkok and Thonburi

Technical rept.
Margaret E. Crawford. 22 Feb 74, 127p Rept no. TR-5
Contract Nonr-1224(56)

Descriptors: *Fresh foods, *Marketing, *Thailand, *Urban areas, Food, Commerce, Commodities, Supplies, Sources, Rural areas.

Identifiers: Bangkok(Thailand), Thonburi(Thailand).

This report deals with one aspect of the problem of food supply and distribution to urban areas. It describes major internal characteristics of nearly two hundred fresh-food markets or talat in Bangkok Thonburi, Thailand. These characteristics are then summarized in a measure of market utilization. Indicators of change within the market system are identified along with market responsiveness in meeting the changing needs of a rapidly growing urban population. (Author)

AD-A044 343/2 PC A07/MF A01
Army Engineer Waterways Experiment Station
Vicksburg Miss

Potential Nonstructural or Low Cost Waterways System Improvements

Final rept.
Frederick M. Anklam. Jun 71, 146p Rept no. WES-MP-O-71-1

Descriptors: *Water traffic, *Inland waterways, Operational effectiveness, Utilization, Optimization, Low costs, Cost benefits, Regulations, Locks(Waterways), Commodities, Barges, Towing, Modification, Management planning and control, Questionnaires.

The inland waterways system of the United States as it exists today has a number of problems associated with near-capacity traffic conditions. In many places on the Mississippi, Ohio, and Missouri Rivers and their navigable tributaries, there are serious impediments to the free flow of waterborne commerce. This study was conducted to determine the potential for more efficient utilization of existing inland waterways resources and facilities as a possible alternative to heavy investment in major construction. The study was based on distribution of a questionnaire, meetings and discussions with the Civil Works Task Group for Inland Waterways Systems Analysis, and visits to Corps of Engineers Civil Works offices and river sites by the author. The inland waterways system is an intricate interweaving of three significant subsystems: the physical waterway, the towing industry, and commodities. These subsystems and their interrelations are discussed in detail herein. It was determined that there are a number of areas of potential for improvement in the inland waterways system. These areas involve such items as changes in operating procedures of the locks, revisions of the operating rules for towboats approaching and using locks, staffing considerations, additional assistance at heavily trafficked locks, and other such factors.

AD-A044 765/6 PC A02/MF A01
Cold Regions Research and Engineering Lab Hanover N H

Effect of Geography on the Extensive Agricultural Use of Sewage (Wpływ Czynnika Geograficznego na Rozpowszechnienie Rolniczego Wykorzystania wód Ściekowych)
Jan Wierzbicki. Sep 77, 10p Rept no. CRREL-TL-642
Trans. of Gaz Woda Technika Santarna (Poland) v24 n1 p407-410 1950, by Sam Blalock.

Descriptors: *Sewage disposal, Waste recycling, Irrigation systems, Fertilizers, Rural areas, Agronomy, Agriculture, Urban planning, Climate, Terrain, Soils, Geographic areas, Land use, Waste management, Translations, Poland.
Identifiers: *Sewage irrigation.

This article considers the causes of the elimination of many irrigated fields in England when the development of this kind of arrangement was appearing in other countries. Unfavorable local and soil climatic conditions necessitated the replacement of irrigated fields by purification plants of another type. The liquidation of irrigated fields in England and in the Eastern United States should not be an example for countries in which other geographic conditions predominate. The considerable simultaneous increase in arrangements of this type in other countries proves the incorrectness of uncritical copying of England's example and negative reaction to the agricultural use of sewage water in localities with conditions which favor its use. (Author)

AD-A044 767/2 PC A02/MF A01
Cold Regions Research and Engineering Lab Hanover N H

Disadvantages and Advantages of Sewage Disposal in Connection with Agricultural Utilization (Wady i Zalety Oczyszczania wód Ściekowych w Polaczeniu Zolich Rolniczym Wykorzystaniem)

Jan Wierzbicki. Sep 77, 10p Rept no. CRREL-TL-645
Trans. of Gaz Woda Technika Sanitarna (Poland) v23 n6 p198-201 1949, by Sam Blalock.

Descriptors: *Sewage disposal, Purification, Sewage treatment, Land use, Irrigation systems, Fertilizers, Agriculture, Waste treatment, Waste recycling, Productivity, Utilization, Urban planning, Rural areas, Translations, Poland.
Identifiers: *Sewage irrigation.

Although the purification of sewage in connection with agricultural use has certain disadvantages as mentioned in this report, the possibility of obtaining very significant economic advantages dictates the widest possible application of land treatment of sewage purification. (Author)

AD-A044 982/7 PC A02/MF A01
Stanford Univ Calif Systems Optimization Lab
Micro-Level Approaches for Improving Water Resource Knowledge Transfer in Rural Areas

Technical rept.
Nathan Buras. Jun 77, 18p Rept no. SOL-77-12 Contract N00014-75-C-0865

Descriptors: *Water resources, *Rural areas, Technology transfer, Irrigation systems, Water supplies, Water wells, Water quality, India, West Africa, Guatemala, Peru, Mexico, Israel, Conferences.

Identifiers: *Meetings, *Developing countries, Information transfer.

One of the topics discussed at the Second International Conference on Transfer of Water Resources Knowledge (Colorado State University, Fort Collins, Colorado, June 29 - July 1, 1977) dealt with utilization of water resources knowledge in the context of regional development. Six papers were presented to the conference under this heading covering a broad range of issues: from a diagnostic description of a difficult situation in rural India, to a theoretical approach to the policy decisions relevant to rural modernization efforts. This general report summarizes the six papers, comments briefly on them, then focuses on two key points which were by-passed by the papers: (a) the resistance to change of farming communities at lower levels of technological sophistication; (b) attempts to overcome this resistance.

SELECTED APPROPRIATE TECHNOLOGIES

- AD-A045 058/5** **PC A02/MF A01**
Rhode Island Univ Kingston Graduate School of Oceanography
Suspended Particle Mineralogy and Transport In Water Masses of the West African Shelf Adjacent to Sierra Leone and Liberia
 Robert L. McMaster, Peter R. Betzer, Kendall L. Carder, Laury Miller, and Donald W. Eggemann.
 22 Jul 74, 17p
 Contract N00014-68-A-0215-0003, N00014-72-A-0363-0001
 Availability: Pub. in Deep-Sea Research, v24 p651-665 1977.
- Descriptors: *Sea water, *Sediment transport, Continental shelves, Continental slopes, Ocean currents, Tropical regions, West Africa, Atlantic Ocean, Sedimentation, Salinity, Clay minerals, Sediments, Montmorillonite, Kaolinite, Ocean bottom topography, Hydrographic surveying, Reprints.
 Identifiers: *Suspended sediments, Liberia, Sierra Leone, Canary current, Gibbsite, Ocean basins.
- A combined hydrographic-mineralogic survey of water masses and their suspended particulate matter was carried out over the continental shelf and upper slope adjacent to Sierra Leone and Liberia; it revealed a two-layered system with distinct clay signatures. The southeastward flowing surface Canary Current was montmorillonite-richer and kaolinite- and gibbsite-poorer than the bottom water. There was a nepheloid layer on the shelf in the lower 20 m of the water column over most of the 480-km long study area. The average suspended particle load of the layer 320 microgram/liter, exceeded that of average open-ocean water by more than an order of magnitude. The clay mineralogy of the material in the near-bottom nepheloid layer is consistent with its being a significant sediment source for the deep equatorial eastern basin of the North Atlantic Ocean. (Author)
- AD-A045 463/7** **PC A03/MF A01**
Civil and Environmental Engineering Development Office Tyndall AFB Fla Detachment 1 (Adtc)
Water Quality Assessment Model - Oxygen Dynamics Model for Low-Flow Streams
 Final rept. 1 Jul 75-1 Mar 77
 Stephen P. Shelton. Mar 77, 32p Rept no. CEEDO-TR-77-15
- Descriptors: *Water quality, *Streams, *Water flow, *Air Force facilities, Mathematical models, Biochemical oxygen demand, Low level, Environmental protection, Waste water, Water pollution, Oxygen, Dissolving.
 Identifiers: Low flow.
- This investigation was undertaken to develop a low-flow stream waste assimilation model to determine the effect of point source discharges at selected Air Force installations. The impetus for this study was the lack of available low-flow stream models and the AF need to evaluate low-flow streams that traverse their installations. From data acquired by this and previous investigations, an analysis of oxygen sinks and sources, unique in their level of significance for low-flow streams, was undertaken. Oxygen sources and sinks considered were carbonaceous BOD, nitrogenous BOD, stream reoxygenation, benthic oxygen demand, and photosynthesis/ respiration. In addition to these, the effects of toxic pollutants upon biological reaction rates and waste assimilative capacity were also explored. Techniques employed in this investigation may be considered as one approach to determine waste assimilation capacity and to simulate variations in the oxygen profile caused by point source wastewater discharges into a low flow stream. The validity and limitations of the overall approach, the ability to extrapolate oxygen profiles, and the ability to transpose conditions to facilitate prediction of future conditions is, at this time, not fully substantiated; however, positive indications have been obtained in model verification that lend credence to the procedures adopted. Future studies should be directed toward validation and improvement of the proposed model and sensitivity analysis to define confidence intervals. (Author)
- AD-A047 981/6** **PC A09/MF A01**
Maryland Univ College Park Inst for Fluid Dynamics and Applied Mathematics
Environmental Conditions In a Tropical Forest Region In Thailand
 Contract rept.
 Helmut E. Landsberg, Owen E. Thompson, Robert E. Taylor, and Rachel T. Pinker. Nov 74, 186p BN-799, PUB-109, ETL-0129
 Contract DAAK02-72-C-0287
- Descriptors: *Climate, *Tropical regions, *Meteorological data, Monsoons, Rainfall, diurnal variations, Seasonal variations, Rainfall intensity, Temperature, Forests, Weather stations, Weather forecasting, Southeast Asia, Thailand, Humidity.
- Major results of a two year project to study the climatological and micrometeorological conditions in a tropical evergreen forest region are summarized in this report. The study has been under the sponsorship of the U. S. Army Engineer Topographic Laboratory. The forest area under study is in the interior of Thailand and is influenced by a cool, dry northeast monsoonal flow from November to March and a warm, moist southwest monsoonal flow from May to September. Measured information were collected during a three year field program sponsored by the U. S. Army Natick Laboratories and included ground station temperature, relative humidity, precipitation, evaporation, hours of sunshine, and tower measurements of temperature, dew point temperature, and wind speed, incoming and reflected solar radiation, incoming and outgoing infra-red radiation and sub-surface temperature profiles in the forest and in a cleared area within the forest region.
- AD-210 105/3** **PC A07/MF A01**
National Academy of Sciences - National Research Council Washington DC
Indigenous Tropical Agriculture In Central America: Land Use, Systems, and Problems
 C.L. DOZIER. 3 Oct 58, 134p Rept no. ffrp r 3p594ffrp r 3p594
 Contract nonr230009
 Distribution limitation now removed. NOTE: Only 35mm microfilm is available. No microfiche.
- Descriptors: *Agriculture.
 Identifiers: *Central America.
- No abstract available.
- AD-408 517/1** **PC A11/MF A01**
National Academy of Sciences-National Research Council Washington D C Foreign Field Research Program
The Changing Economy of Northern Greece Since World War II
 Paul P. Vouras. 1962, 238p Rept no. NAS-NRC-FFRP-16
 Contract Nonr-2300(09)
 Distribution limitation now removed. NOTE: Only 35mm microfilm is available. No microfiche.
- Descriptors: *Economics, Geography, Climate, Forestry, Population, Fishes, Industries, Transportation, Bibliographies, Irrigation, Cereals, Food, Textile industry, Leather, Roads, Soils, Minerals, Agriculture, Mining engineering, Electricity, Commerce, Production, Erosion, Animals, Meat, Chemical industry, Metals, Processing, Railroads.
- The objective of this research was to investigate the post World War II changes in the economy of Northern Greece. Nine months were devoted to geographical field work. Field work was essential in order to observe and record the changes that have taken place in the region's economy. Also, officials, private business men, and professional men were consulted to obtain statistical data. Insofar as possible Greek sources of the most recent date were used. The book is divided into 11 chapters: physical and human aspects, agriculture, livestock, fishing, forestry, mining, industry and handicrafts, electricity, transportation, ports, trade, and tourism. (Author)
- AD-417 467/8** **PC A07/MF A01**
 California Univ Livermore Lawrence Radiation Lab
- Patterns of Settlement and Subsistence In Southwestern Angola**
 Alvin W. Urquhart. 1963, 149p Rept nos. NRC-R-18, Pub-1096
 Contract Nonr230009
 Also available from Printing and Publishing Office, NRC, Washington, D. C. for \$4.00 per copy.
 Distribution limitation now removed. NOTE: Only 35mm microfilm is available. No microfiche.
- Descriptors: *Survival(Personnel), Economics, Agriculture, Housing(Dwellings), Social sciences, Food, Storage, Population, Terrain, Processing.
 Identifiers: *Angola, Rural areas, Developing countries, Africa.
- This study presents the findings of a year of field work in Portugal and Angola. The author attempts to describe and explain the patterns of settlement and subsistence of the farmer-herders and neighboring African peoples who live on the Huila Plateau of southwestern Angola. A historical background of the occupation and colonization of this area by Europeans supplements this study. (Author)
- AD-420 690/0** **PC A10/MF A01**
Chicago Univ Ill
Tradition, Season, and Change In a Turkish Village
 John F. Kolars. Aug 63, 205p 82, NRC-FFRPR15
 Contract Nonr230009
 Doctoral thesis.
 Distribution limitation now removed. NOTE: Only 35mm microfilm is available. No microfiche.
- Descriptors: *Sociology, *Rural areas, Culture, Transportation, Housing(Dwellings), Population, Ecology, Agriculture, Geography, Commerce.
 Identifiers: *Turkey.
- Contents: Antalya Vilayet and the regional setting; The villages of the Boga Cay area; The village and its farm units: Bahtili; Village functional organization: Bahtili; External village connections: Bahtili; Variations in village agriculture: Akdamlar and Geyik Bayiri Mahalleler; Variables important in the determination of farm crop mixes, The cultural and natural determination of farm crops and agricultural activities; The seasonal cycle of livelihood activities in the Boga Cay area; The development of commercial agriculture in the Boga Cay area.
- AD-464 900** **PC A02**
Special Operations Research Office, Washington, D. C. Counterinsurgency Information Analysis Center
Irrigation as a Factor in the Economic Development of Thailand
 James R. Price. Jun 64, 10p Rept no. SORO/CINFAC/1-64
 Contract DA-49-092-ARO-7
- Descriptors: *Irrigation systems, Thailand, *Cereals, Irrigation systems, History, Economics, Floods, Counterinsurgency, Agriculture, Rural areas.
- The question of irrigation and flood control in Thailand has been historically bound together not only with the immediate problems of production of Thailand's main export crop of paddy rice, but with the pattern of Thailand's foreign economic and political relations. Developmental irrigation and flood control projects only now nearing completion are virtually identical to those recommended more than half a century ago by a Dutch irrigation adviser, and which could have been completed within twelve years at a fraction of the cumulative costs, both in capitalization and crop losses, to date. (Author)
- AD-600 859** **PC A02**
Forest Products Lab Madison Wis
Woodworking Machines.
 May 64, 2p FPL-048
- Descriptors: *MACHINES, WOOD, *SAWS, WOOD, MILLING MACHINES, INDUSTRIAL EQUIPMENT, MATERIAL SEPARATION.
 Identifiers: WOODWORKING MACHINES.

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Woodworking machines are made to do a wide variety of jobs. For any one job there are usually a number of makes, sizes, and styles of machines from which to choose. They are not standardized. Only a brief classification and outline of specifications for fairly typical machines of the more important types is attempted. Small light machines of the home workshop size are not included. Woodworking machines may be divided into three broad classes based on function: sawmill, planing mill, and industrial plant machinery. The function of sawmill machinery is to cut the log into rough, green lumber. The planing mill takes the rough lumber (usually dry), and prepares it for general construction uses, such as flooring, siding, shiplap, or framing. The industrial plant cuts up lumber and makes it into doors, furniture, boxes, or other fabricated products. (Author)

AD-608 900 PC A02
 Columbia Univ New York
Use of Fluorescent Tracers to Determine Fore-shore Sediment Transport, Sandy Hook, New Jersey.
 Technical rept. no. 6
 Warren E. Yasso. 1964, 2p
 Contract Nonr26668

Descriptors: *BEACHES, SEDIMENTATION, *SEDIMENTATION, BEACHES, *TRACER STUDIES, SEDIMENTATION, LABELED SUBSTANCES, FLUORESCENCE, SAND, OCEAN WAVES, TIDES, VELOCITY, PARTICLES, PARTICLE SIZE, EROSION, COATINGS, ATLANTIC OCEAN, NEW JERSEY.
 Identifiers: FORESHORE.

Each of four size classes of foreshore sand from Sandy Hook, New Jersey, was color coded with daylight and ultraviolet fluorescent coating material. These tracer particles were introduced at mid-swash line on the foreshore surface at Kingmill Beach, Sandy Hook, two hours prior to high tide. During the test Atlantic Ocean waves approaching at an angle of approximately 5 degrees to the shoreline caused 5.3-second breakers of 2.4-foot maximum height. A sampling line transverse to the foreshore was established 100 feet downdrift from the point of introduction. In a time-integration procedure samples were obtained by scraping a 0.10-foot deep and 0.18-foot wide channel a distance of 10 feet upslope from the backwash limit. Sub-samples of the 18 samples taken during the 69.7 minutes after marked particle introduction were examined for tracer particle content. Recovery data indicate particles in the smallest size class ($0.701 > d > 0.589$ mm) began arriving at sampling line 38.9 minutes after introduction; equivalent to 2.6 ft/min maximum transport velocity. Particles in the next largest size class began arriving 50.0 minutes after introduction; equivalent to 2.0 ft/min maximum transport velocity. However, a maximum number of marked particles in both size classes was found in a sample taken 62.3 minutes after introduction.

AD-615 459 PC A02
 Special Operations Research Office American Univ Washington D C
A Selected Inventory of Latin American Agricultural Colonies with Annotated Bibliography.
 Curtin Winsor Jr., and Joseph Macrum. 1964, 2p
 Rept no. soro/cinfac/18-65

Descriptors: *RURAL AREAS, SOUTH AMERICA, *SOUTH AMERICA, RURAL AREAS, *CENTRAL AMERICA, RURAL AREAS, AGRICULTURE, BIBLIOGRAPHIES, BRAZIL, CHILE, COLOMBIA, ECUADOR, GUATEMALA, HONDURAS, PERU, VENEZUELA.
 Identifiers: COLONY PROJECT, LATIN AMERICA, BOLIVIA, PARAGUAY, URUGUAY, COLONIZATION.

With a few noted exceptions, this paper is limited in its scope to agricultural colonies and settlements that were founded after 1945 and had sufficient literature to justify a profile-outline. As such, the paper identifies only a small part of the literature on the process of land settlement in present-day Latin America. (Author)

AD-636 809 PC A02 MF A01
 Rand Corp Santa Monica Calif
A Short Survey of Colombian Agricultural Development In Recent Years.
 Dalbert A. Fitchett. 25 May 66, 2p Rept no. P-3370

Descriptors: *Agriculture, *Colombia, Reviews, Rural areas, Economics, Population, Production, Commerce, Food, Geography.

No abstract available.

AD-638 118 PC A02 MF A01
 McGill Univ Montreal (Quebec) Dept of Geography
Savanna-Tropical Forest Boundaries Symposium: Venezuela.

Technical rept. on Savanna Research Project.
 Theo L. Hills. 1 Jul 66, 2p Rept no. Occasional Paper-1
 Contract Nonr-3855(00)
 Availability: Published in Nature and Resources v1 n4 p1-5 Dec 1965.

Descriptors: *Geography, *Venezuela, Ecology, Jungles.
 Identifiers: Savanna ecosystem.

No abstract available.

AD-643 179 PC A17 MF A01
 Boston Univ., Mass. Dept. of Geography.
Fire In Tropical Forests and Grasslands.

Technical rept.
 Robert B. Batchelder, and Howard F. Hirt. Jun 66, 396p ES-23
 Contract DA-19-129-AMC-229(N)

Descriptors: *Fires, *Tropical regions, *Forest fires, Tropical regions, *Grasses, Fires, Meteorology, Soils, Control, Armed forces research, Climatology, Culture, Ecology, Maps.

Fire in the tropics has a long history in which frequent wide-spread burning has profoundly altered physical and cultural environments. A vast and diverse literature pertaining to fire and its effects in tropical forests and grasslands was evaluated, classified and presented in a selected bibliography. Emphasis is on the relation of fire to climate, natural vegetation, soils, cultural origins, technological level and way of life and other significant factors of the total environment. The incidence and frequency of occurrence of fire are examined in terms of the geographic distribution of passive and active environmental characteristics. The relationship of burning to climate and natural vegetation is shown on maps which represent a first attempt to depict the geographic distribution of fire in the tropics. Potential combustibility and the implications of fire to military operations are discussed. (Author)

AD-651 116 PC A04 MF A01
 American Univ Washington D.C. Center for Research in Social Systems
Resettlement in Latin America: An Analysis of 35 Cases.
 Milton Jacobs, Alexander R. Askenasy, and Nonita P. Scott. Apr 67, 55p
 Contract DA-49-092-ARO-7

Descriptors: *Management planning, Latin America, *Government(Foreign), Economics, United States government, Agriculture, Military training, Population, Political science, Social sciences, Rural areas, Education, Medicine, Housing, Federal budgets.

A study of agricultural settlements (or colonies) in Latin America: the history of settlement, current governmental efforts in colonization, and an analysis of the colonies in terms of success or failure are included. Detailed description of five of the settlements is appended.

AD-653 814 PC A02 MF A01
 California Univ Berkeley Dept of Physics

Auroral-Zone Electron Precipitation Accompanying a Sudden Impulse in the Geomagnetic Field.

Robert R. Brown. 30 Dec 66, 6p AFOSR-67-1389
 Grant AF-AFOSR-331-65
 Availability: Published in Journal of Geophysical Research v72 n9 p2448-51 May 1 1967.

Descriptors: *Terrestrial magnetism, *Storms, Aurorae, Electrons, Balloons, Energy, X rays, Intensity, Periodic variations.

Balloon observations of bremsstrahlung accompanying a sudden impulse of 955 gamma in H indicates that the x-ray fluxes were soft, with e-folding energy E_0 approximately equals 13 keV, and relatively unstructured in time. (Author)

AD-653 856 PC A03 MF A01
 Naval Research Lab Washington DC
Natural Resistance of Woods to Biological Deterioration In Tropical Environments. Part I. Screening Tests of a Large Number of Wood Species.

Interim rept.
 C. R. Southwell, C. W. Hummer, Jr. B. W. Forgeson, T. R. Price, and T. R. Sweeney. 7 Feb 62, 49p Rept no. NRL-5673-Pt-1

Descriptors: *Wood, Biological contamination, *Tropical deterioration, Wood, Identification, Sampling, Exposure, Test methods, Marine borers, Resistance(Biological), Isoptera, Degradation, Tropical tests, Sea water, Soils, Fungus deterioration.

In four different tropical environments, heavily infested with wood-destroying organisms, 114 species of scientifically identified woods have been undergoing a screening test for periods up to an 18-month exposure. Many of the woods were selected because of their reputed resistance to biological attack. Results of marine borer resistance studies have revealed 21 woods to be highly resistant to borers in Pacific Ocean water for the first 14 months of exposure. In tropical brackish water only 3 woods studied were highly resistant and very heavy damage was observed on 69 during the 14-month period. Stake tests in tropical jungle soil on both the Atlantic and Pacific Coasts of Panama showed 26 woods to be very durable to both subterranean termites and fungal decay for the first 18 months of exposure. A number of these resistant woods had not been studied previously. From the results of these studies, each wood included has been assigned resistance ratings of high, moderate, or low in respect to marine borer attack in sea water, teredo attack in brackish water, subterranean termites in tropical soil, and fungal decay in contact with jungle soil. Detailed descriptions of wood species which are considered to be of special interest are included. (Author)

AD-655 296 PC A02 MF A01
 Kalamazoo Coll Mich
Some Advantages and Disadvantages of Small Scale Industry in a Highly Industrialized Economy.

Technical rept.
 Stillman Bradfield, and Anibal Del Aguila. 1967, 9p Rept no. TR-3
 Contract N00014-67-A-0098-0001, ARPA Order-852

Descriptors: *Industries, Management engineering, Industrial relations, Costs, Personnel management, Organizations, Industrial production, Commerce.

The survival of many of the small scale manufacturers in Kalamazoo is explained in terms of the special flexibilities and opportunities they possess which enable them to isolate themselves from the competition of larger producers, and occupy a special niche in the market. Close, personal contact between the owner-manager of a small manufacturing plant and his employees, suppliers and customers enable him to give special attention when required, and also to be able to obtain good technical advice when needed. Inefficiencies resulting from a lack of specialization of personnel are in part compensated for by the costs avoided when

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the manager fulfills all of these functions himself.
(Author)

AD-657 007 PC A02 MF A01
Rand Corp Santa Monica Calif
Review of 'Changing Patterns of Administration In Rural East Pakistan'.
Wayne Wilcox. Aug 67, 5p Rept no. P-3647

Descriptors: *Government(Foreign), Pakistan, Rural areas, Political science, Suburban areas, Leadership, Management engineering, Economics, Social sciences, Reports, South Asia.

A very brief review of the book *Changing Patterns of Administration in Rural East Pakistan* which was prepared at the Asian Studies Center, Michigan State University.

AD-657 858 PC A10 MF A01
California Univ Berkeley Dept of Geography
A Historical Geography of the Santa Marta Area, Colombia.
James R. Krogzemis. 1967, 224p
Contract Nonr-3656(03)

Descriptors: *Geography, Colombia, History, Climatology, Archaeology, Terrain, Agriculture, Population, Rural areas, Economics, Aquatic animals, Forestry, Recreation, Industries, Mountains, Beaches, Environment, Rivers, Tables, Maps.

Contents: Prehistory and Spanish conquest; The lowlands and coast surrounding the Sierra Nevada de Santa Marta; The Cienaga Grande de Santa Marta; The highlands of the Sierra Nevada de Santa Marta; The Indians of the Sierra Nevada.

AD-664 641
Arizona Univ Tucson Inst of Arid Lands Research
Inventory of Research on Weather and Climate of Desert Environments.
Clayton H. Reitan, and Christine R. Green. 1967, 78p
Contract DA-49-092-ARO-71
Chapter 2 of Inventory of Geographical Research on Desert Environments. See also Chapter 5, AD-664 013.
Availability: Published in Copyright Journal.

Descriptors: *Climatology, Deserts, Wind, Storms, Atmospheric temperature, Atmospheric motion, Tropical regions, Water, Measurement, Instrumentation, Evapotranspiration, Artificial precipitation, Fog, Classification, Solar radiation, Indexes, Bibliographies.

Contents: Discussion of state of knowledge; (Climatic data, climatic data for each desert, synoptic climatology, weather systems, desert storms, upper-air circulations, aridity, climatic typing and indexes of aridity, weather modification, microclimate, radiation, bibliographies, depositaries).

AD-667 551 PC A03 MF A01
Weather Wing (1st) San Francisco Calif 96553 Scientific Services
Extreme Daily Rainfall Amounts in the Republic of Vietnam.
Gary D. Atkinson. Mar 68, 34p 1WW-Technical Study-16

Descriptors: *Rainfall, Vietnam, Diurnal variations, Volume, Distribution, Mountains, Weather forecasting, Intensity, Weather stations, Atmospheric precipitation, Meteorological charts, Terrain, Predictions, Hydrology, Civil engineering, Tropical regions.
Identifiers: South Vietnam.

The double exponential distribution is applied to extreme daily rainfall amounts in the Republic of Vietnam. With few exceptions, this distribution fits the annual extremes very well and is used to determine expected daily extremes for return periods of 5 to 100 years. The expected extremes for a 100 year return period range from 6 to 8 inches in the Southern lowlands to over 20 inches in the mountainous regions in the north. The double exponential distribution also gives a fair fit to the monthly extremes during the wetter months. The seasonal

distribution and physical causes of the annual daily extremes are discussed. Along the east coast and northern mountains, the highest daily rainfall amount each year generally occurs between mid-September and mid-December corresponding to the maximum frequency of tropical cyclones during this period. Over the remainder of the country, the annual extremes are caused by heavy thunderstorms and can occur any time during the southwest monsoon or transition months (April through November). (Author)

AD-668 852 PC A09 MF A01
Arizona Univ Tucson Inst of Arid Lands Research
Inventory of Research on Vegetation of Desert Environments.

William G. McGinnies. 1967, 190p
Contract DA-49-092-ARO-71
Chapter 6 of Inventory of Geographical Research on Desert Environments. See also Chapter no. 5, AD-664 013.
Availability: Published in Copyrighted journal.

Descriptors: *Plants(Botany), Deserts, Reviews, Scientific research, Trees, Grasses, Periodic variations, Colors, Soil mechanics, Physical properties, Sand, Fires, Herbicides, Food, Fibers(Natural), Insects, Fuels, Tables, Bibliographies.

The objective of the study chapter is to review and evaluate existing information and research on the vegetation of the deserts of the world, to ascertain notable deficiencies, and to propose possible future research and improvements to the general body of knowledge of desert vegetation. (Author)

AD-668 853
Arizona Univ Tucson Inst of Arid Lands Research
A General Summary of the State of Research on Ground-Water Hydrology.

Eugene S. Simpson. 1967, 24p
Contract DA-49-092-ARO-71
Chapter 8 of Inventory of Geographical Research on Desert Environments. See also Chapter 6, AD-668 852.
Availability: Published in Copyrighted journal.

Descriptors: *Hydrology, Deserts, Water, Terrain, Natural resources, Reliability, History, Well logging, Surface properties, Dams, Underground, Drainage, Storage, Physical properties, Management planning, Sources, Israel.

This report is one of a series under a program started in November, 1964, entitled 'An Inventory of Geographical Research on Desert Environments.' Geographic areas covered by the inventory were generally those classified as arid or extremely arid. Some variation in coverage occurs from chapter to chapter, without change in the objective of compiling and presenting the greatest possible amount of useful information in the allotted time. The purpose of the inventory is to determine in detail what topics have been or are being investigated for the world's deserts, to appraise the reported work, and to disclose areas of study where further work is needed. The series of chapters does not attempt to recapitulate all information known about the deserts of the world, but rather comprises a compendium-guidebook to past and present research. It is based upon a critical review of the published literature augmented by consultations with specialists. (Author)

AD-670 260 PC A03 MF A01
Rand Corp Santa Monica Calif
Political Consequences of Rural Development Programs in Indonesia.

Guy J. Pauker. May 68, 30p Rept no. P-3864
Presented at the Political Development Seminar of the Southeast Asia Development Advisory Group, Dec 1967, Los Angeles, Calif.

Descriptors: *Agriculture, Indonesia, *Political science, Indonesia, Economics, Population, Rural areas, Social sciences, Leadership, Attitudes, Government(Foreign), Decision making, Public relations, Statistical data, Management planning, History.

A discussion is presented of the agrarian situation in Indonesia and of the political consequences of the failure of all rural development programs since the achievement of independence in 1949. Some conclusions are drawn concerning the order of magnitude of the agrarian problem facing Indonesia. The most salient fact is that, according to current estimates by the International Bank for Reconstruction and Development, in the 1960-1966 period rice production increased at a rate of 1.6 percent per year whereas the population growth rate was 2.4 percent. (Author)

AD-671 856 PC A08 MF A01
McGill Univ Montreal (Quebec) Dept of Geography
The Ecology of the Forest/Savanna Boundary (Proceedings of the Igu Humid Tropics Commission Symposium, Venezuela, 1964).

Technical rept. on Savanna Research Project
Theo L. Hills, and Roland E. Randall. May 68, 153p Rept nos. TR-14, Savanna Research Series-13
Contract Nonr-3855(00)

Descriptors: *Plants(Botany), *Ecology, Trees, Grasses, Rainfall, Distribution, Climatology, Soils, History, Paleontology, Floods, Deserts, Fires, Animals, Humidity, Symposia, Tropical regions, Venezuela, Canada.
Identifiers: Savannas.

The report is the outcome of a symposium on the ecology of the forest/savanna boundary. The papers presented at the meeting have been cut and edited so that a theme is presented rather than a series of papers. In the introduction, the problems involved in savanna classification and the ambiguity of terminology are discussed, types of savanna found in different parts of the world described, and methods of examination analysed. The section is concluded by a description of the field trip made by the Symposium members, during which many of the differences in attitude were seen in a fresh light. A second chapter is concerned with savanna/forest boundaries held stable by factors of the physical environment; here the roles of flooding and desiccation, climate, soils and geomorphology are examined. In the third chapter the authors discuss stable boundaries resulting from human action. Fire and the role of domesticated grazing animals are seen as the major factors. The subject of the fourth section is the boundary when not in equilibrium. Many factors are examined in different parts of the world including soil, wild animals, fire, palaeoclimatology and man. An evaluation is made of the use of palynological and historical data. (Author)

AD-672 002 PC A06 MF A01
Texas Univ Austin Electronics Research Center
A Study of Proposed Neural Excitation by Interaction of Ultrasonic and Electromagnetic Energy.

Technical rept.
James D. Wolfe, and Elmer L. Hixson. 1 May 68, 124p TR-48, AFOSR-68-0879
Grant AF-AFOSR-766-67

Descriptors: *Nerve cells, Stimulation, Models(Simulations), Ultrasonic radiation, Electric fields, Interactions, Thresholds(Physiology), Frequency, Feasibility studies, Pressure, Electrolytes(Physiology), Partial differential equations, Numerical methods and procedures, Perturbation theory, Fourier analysis, Experimental data. Identifiers: Fast Fourier transform.

A neural stimulation system is proposed exploiting the low frequency response of neurons to an excitation potential. Ultrasonic and electromagnetic energy interact in electrolytic solutions due to conductivity variations caused by the ultrasonic pressure waves in the solution. The potential of largest magnitude resulting from the interaction has a frequency equaling the sum and difference of the ultrasonic and electric field frequencies. The frequency of the applied field is chosen to exceed the response time of the neurons, preventing excitation; the frequency of the induced potential, being the difference of two frequencies, can be constrained to fall within the response time of neurons and produces excitation. The shape and position of the volume containing the excitation potential is

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controlled by focusing the ultrasonic waves to high intensity in a small volume. The system is modeled both electrically and ultrasonically by a simple salt solution similar to body interstitial fluids. The relevant field equations for a conducting solution are applied to the model; the conductivity function contains a small time varying perturbation which is a linear function of the local dynamic pressure due to a focused ultrasonic source. The resultant nonlinear, partial differential equation is solved by an assumed power expansion of the solution in applying perturbation theory. (Author)

AD-675 354 PC A02 MF A01
 National Research Council of Canada Ottawa (Ontario) Div of Building Research
Opening Unserviced LOTS to Building by Use of Septic Tank.
Housing Note
 W. B. Watson. Jul 66, 6p Rept no. HN-27
 Reprinted from Canadian Builder, v16 n5 p42-45 May 66.

Descriptors: *Sewage, Rural areas, *Tanks(Containers), Sewage, Hazards, Soils, Terrain, Population, Design, Economics, Operation, Maintenance, Substitutes, Specifications, Public health, Canada.
 Identifiers: Septic tanks.

The value, construction, maintenance, and operation of septic tanks in isolated areas are discussed, along with problems and hazards.

AD-676 124 PC A05 MF A01
 Applied Scientific Research Corp of Thailand Bangkok
Tropical Environmental Data (Trend): Cooperative Research Programme No. 27.
 Semiannual rept. no. 2, 1 Jul-31 Dec 67. 1968, 96p
 Contract DAJB29-67-C-0122

Descriptors: *Forestry, Tropical regions, *Rainfall, Thailand, Hydrology, Micrometeorology, Soils, Materials, Deterioration, Bacteria, Fungi, Periodic variations, Rivers, Terrain, Mapping, Evapotranspiration, Sensors, Atmospheric temperature, Plants(Botany).
 Identifiers: Dry-evergreen forest.

The programme is an interdisciplinary study of a dry-evergreen forest environment in the 1,500 mm annual rainfall zone about 300 km north-east of Bangkok and 60 km south of Nakhon Ratchasima (Khorat). The programme is providing a reference framework of data on environmental factors, particularly those which relate to tropical deterioration of materials and to personnel operating in tropical forest environments, and is examining the interaction of meteorological, hydrological, soils, vegetation and other biological factors in such environments. (Author)

AD-677 010 PC A14 MF A01
 Smithsonian Institution Washington DC
Ecological Study in Korea. Part I. A Cooperative Program for Ecosystem Research In Korea.
 Final rept. Oct 66-Sep 68
 Helmut K. Buechner, Edwin L. Tyson, and Ke Chung Kim. Sep 68, 311p AFOSR-68-2148
 Contract F44620-67-C-0013
 See also Part 2, AD-676 660.

Descriptors: *Ecology, Southeast Asia, Education, Biology, Research program administration, Natural resources, Plants(Botany), Personnel, Reports, Animals, Soils, Climatology.
 Identifiers: Demilitarized zones, *Korea, Developing countries.

The program of 'Ecological Study in Korea' that was sponsored by the Smithsonian Institution and the Air Force Office of Scientific Research was initiated with the following objectives: (1) to provide a general description of the vegetation, animal life, soils, physiography, and climate of the study area; (2) to prepare appropriate vegetation and physiographic maps to accompany the descriptions; (3) to carry out a series of research projects of a preliminary nature on the physical characteristics,

flora, and fauna of the study area by Korean scientists; and (4) to prepare a sound proposal for a long-range program to be submitted to granting agencies. (Author)

AD-678 292 PC A02 MF A01
 Harvard Univ Cambridge Mass East Asian Research Center
Agriculture as the Foundation.
 Ezra F. Vogel. Oct 68, 23p AFOSR-68-2543
 Contract AF 49(638)-1399
 Availability: Pub. in World Politics, v28 n4 p761-779 Jul 68.

Descriptors: *Agriculture, China, *Production control, Effectiveness, Communism, Decision making, Economics, Rural areas, Problem solving, Management engineering.
 Identifiers: Collective farming, Villages.

China's decision to collectivize agriculture was sudden and required a series of adjustments. Following collectivization, it was necessary first to develop and later expand private plots, but this created such serious problems for the collective fields that they were again eliminated in 1958. Despite collectivization and inputs into villages, agriculture which was the foundation of industrial development was not producing enough to make possible more rapid economic development from the period of mid-1950's until the mid-1960's. It was for this reason that greater efforts were placed in the early 1960's on agriculture. (Author)

AD-678 728 PC A04 MF A01
 Rand Corp Santa Monica Calif
Relative Wages, Skill Shortages, and Changes in Income Distribution in Colombia.
 Robert L. Slighton. Nov 68, 75p Rept no. RM-5651-RC-AID
 Contract F44620-67-C-0050

Descriptors: *Labor, Colombia, Manpower studies, Wages, Inequalities, Growth, Statistical distributions, Rural areas, Urban areas, Employment, Classification, Tables, Agriculture, Industries, Transformations, Economics, Training.
 Identifiers: Income distribution, Skill shortages.

An analysis is made of the income distribution relative to the economic growth in Colombia. Distribution of income in Colombia has been, and is, very unequal: 10 percent of the population of the large cities receives about half of the total personal income. This study examines the hypothesis that this inequality will widen if growth of the modern sector of the economy is retarded after the transition from agrarianism to the dual economy is begun. (Author)

AD-679 182 PC A04 MF A01
 Negev Inst for Arid Zone Research Beersheba (Israel) Dept of Geobotany
Use of Vegetation as an Indicator for Soil Properties under Desert Conditions.
 Annual rept. no. 2, 1 Oct 65-1 Dec 66
 Gideon Orshan, Uri Gavish, and Ilan Borovic. Mar 68, 67p
 Contract DA-91-591-EUC-3806

Descriptors: *Soils, Deserts, *Plants(Botany), Deserts, Classification, Thickness, Sand, Distribution, Clay, Physical properties, Climatology, Plant tissue, Water, Measurement, Israel.
 Identifiers: Summer, Negev Desert.

The report discusses the root systems in sandy deserts as related to soil properties. 13 leading species were excavated and described. These are classified in three types. Soil moisture was measured at two locations in the Negev desert during the summer of 1966 and its use by plants discussed. The effect of sand cover and irrigation on the competition between leading desert psammophytes was examined. (Author)

AD-679 459 PC A10 MF A01
 National Academy of Sciences-National Research Council Washington D C Foreign Field Research Program

The Effects of African Agricultural Practices on Soil Productivity and Nutrient Levels in Kenya.

Final rept.
 Paul L. Lehrer. Sep 61, 209p
 Contract N00014-67-A-0244

Descriptors: *Rural areas, Agriculture, *Agriculture, *Kenya, Soils, Soil mechanics, Production, Nutrition, Detonation, Fertilizers, Economics, Sociology, Structural geology, Climatology, Rainfall, Maps.
 Identifiers: Nutrients.

The purpose of this study is to examine the effects of African agricultural practices in Kenya on soil productivity. Emphasis is placed on discovering what effects cultivation would have on the nutrient levels of virgin soils in that country. It was found that fragmentation, female labor, and the attitude toward fertilization was actually more important than the more tangible physical considerations in understanding the basic characteristics of African agriculture. The deterioration of the physical condition of the soil through continuous cultivation perhaps is more responsible for a decreased productivity than is nutrient depletion. Only through sustained use of fertilizers can the productivity of Kenya soils be substantially increased. The economic future of the African farmer will depend upon his ability to obtain a higher income through the sale of cash crops. (Author)

AD-679 473 PC A08 MF A01
 National Academy of Sciences-National Research Council Washington D C Foreign Field Research Program
Drained-Field Agriculture in Southwestern Tlaxcala, Mexico.
 Final rept.
 Gene C. Wilken. Sep 68, 155p
 Contract N00014-67-A-0244

Descriptors: *Rural areas, Agriculture, *Agriculture, *Mexico, Climatology, Rainfall, Population, Soils, Drainage, Floods, Erosion, Irrigation systems, Deposition, Production, Reclamation, Ecology, Sociology.
 Identifiers: Tlaxcala(Mexico).

This study examines the land and water management problems of Tlaxcala, concentrating on the southwestern portion of the state which lies at the northern end of the Basin of Puebla on the Mesa Central of Mexico. To cope with poorly drained, sand-filled streamways which threaten flood and deposition on basin floor soils, the Tlaxcala farmers practice sophisticated land conservation and reclamation techniques, using a minimum of equipment. In the process, they have created a productive and distinctive agricultural region. A description of the methods they employ to maintain and expand the agricultural base in this difficult environment forms part I of this study. In part II, the ecology of farm life is discussed and the geographical relationship between complexes of agricultural practices, social systems, and populations is discussed. (Author)

AD-679 474 PC A11 MF A01
 National Academy of Sciences-National Research Council Washington D C Foreign Field Research Program
A Biogeographical Investigation of the Sierra de Tuxtla in Veracruz, Mexico.
 Final rept.
 Robert F. Andrus. 1963, 248p
 Contract N00014-67-A-0244

Descriptors: *Natural resources, Rural areas, *Rural areas, *Mexico, Mountains, Volcanoes, Structural geology, Soils, Climatology, Drainage, Birds, Animals, Forestry, Archaeology.
 Identifiers: Biogeography, Veracruz(Mexico), Sierra de Tuxtla.

The Sierra de Tuxtla, a small, isolated volcanic mountain area near the Gulf coast of southern Veracruz, Mexico, affords excellent conditions for biogeographical investigations. The present study describes the manner in which physical and human factors have influenced native vegetation, non-transient avifauna and larger forest mammals in

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this tropical region. Physical factors considered are geology, land configuration, climate, drainage and soils; human factors examined include population, settlement and forms of land use. The Sierra has no major industrial raw materials, so agriculture continues to be the principal occupation, with commercial plantations providing export products. Although attempts are being made to improve agriculture and conserve forests, immediate and effective measures are required to control land use and enforce game laws. Varied natural habitats and a rich fauna provide excellent bases for a national park or wildlife refuge. Such an area would conserve forests, soils, water and wildlife, and afford a place for scientific study and recreation. A working man-land relationship must be established if the Sierra's natural resources are to be used wisely, its agricultural productivity increased and natural features preserved. (Author)

AD-679 475 PC A12 MF A01
 National Academy of Sciences-National Research Council Washington D C Foreign Field Research Program
A Philippine Sugar Cane District: Spatial Phenomena Affecting Sugar Cane Production on the Haciendas.
 Final rept.
 Norman W. Schul. Aug 62, 256p
 Contract N00014-67-A-0244

Descriptors: *Agriculture, *Philippines, Statistical analysis, Climatology, Terrain, Management planning, Labor, Commerce, Rural areas, Machines, Regression analysis, Transportation, Industries, Soils, Production, Site selection, Maps.
 Identifiers: Sugar cane.

The study primarily involves the analysis of physical and cultural factors affecting sugar cane yield although it will also further an understanding of the spatial organization of sugar cane production. The study is based on the Victorias Milling District, which covers approximately 37,000 hectares in northern Negros Occidental Province in the central Philippines. A simple model was used to describe the area's spatial organization of sugar cane production in the sphere of plantation agriculture. The model stipulates (1) an extensive land area, (2) mono-cropping, (3) centralized managerial control, (4) an abundant labor supply and (5) production for the export market. It has these further qualities which are believed to be comparable for most sugar cane districts in the Philippines: the characteristic hacienda-central settlements, the problems of mechanization, and the quota system for sugar cane. The yield factors studied were hacienda size, hauling distance from the hacienda to the mill, the slope, soil quality, the necessity for trucking, tenure, and the type of power used in land preparation. (Author)

AD-679 477 PC A11 MF A01
 National Academy of Sciences-National Research Council Washington D C Foreign Field Research Program
Approaches to Spatial Structure: Field Studies In India.
 Final rept.
 Robert C. Mayfield. 1958, 247p
 Contract N00014-67-A-0244

Descriptors: *Rural areas, Housing, *Housing, *India, Population, Density, History, Sampling, Sociology, Costs, Commerce, Agriculture, Analysis of variance, Physiology.
 Identifiers: Nomads, Land use.

This is a collection of studies representing approaches to spatial structure in India. The first study deals with the Baazighars and Gadoliyas, traditionally nomadic groups in the Indian Punjab, as to the impacts of canal irrigation and political partition. The topic of the second study is physiological densities in which three villages of Bihar are studied. Agriculturally unproductive land is subtracted from overall village area in order to obtain a ratio suggesting meaningful rural population pressures. The third study uses the small portion of the valley of upper Beas River for comparing the relative efficiency of systematic, stratified random, and haphazard methods of line sampling of land use. The fourth and major study examines the spatial struc-

ture of two districts of Central Punjab, India. (Author)

AD-679 833 PC A02 MF A01
 Air Force Office of Scientific Research Arlington Va Directorate of Information Sciences
Information Services for Small-Scale Industry.
 Rowena W. Swanson. 1968, 4p AFOSR-68-2663
 Presented at the Puerto Rico Conference on Information Technology and Resources, San Juan, Puerto Rico, 20-21 Jun 68.
 Availability: Pub. in American Documentation, v19 n4 p412-413 Oct 68.

Descriptors: *Information retrieval, *Industries, Scientific research, Technical information centers. Identifiers: *Information services, Transfer of technology.

The report presents highlights of several papers which reviewed experiences of large-scale and specialized information systems and services from the viewpoint of their value to small-scale, science-based industries, particularly those in developing regions. A climate conducive to technological change appears to be a cornerstone to the building and financing of effective, interactive, information-transfer networks. (Author)

AD-683 052 PC A02 MF A01
 Army Biological Labs Frederick Md
Portable Laboratory Kit for Water Testing under Field Conditions.
 S. M. Drachev, and S. D. Zamyslova. 13 Mar 52, 5p Rept no. Trans-654
 Trans. of Gigiena i Sanitariya (USSR) v15 n7 p45-48 1950.

Descriptors: *Water supplies, Test equipment, Sanitary engineering, Laboratory equipment, Portable, Chemical analysis, Rural areas, USSR.
 Identifiers: Translations.

No abstract available.

AD-683 935 PC A13 MF A01
 Foreign Technology Div Wright-Patterson AFB Ohio
Some Simple Methods of Cybernetic Data Processing of Diagnostic and Physiological Investigations.

V. S. Genes. 12 Apr 68, 290p Rept no. FTD-MT-24-394-67
 Edited machine trans. of mono. Nekotorye Prostye Metody Kiberneticheskoi Obrabotki Dannyykh Diagnosticheskikh i Fiziologicheskikh Issledovaniy, Moscow, 1967 p1-208.

Descriptors: *Diagnosis, *Data processing systems, Diseases, Tables, Etiology, Therapy, Computers, USSR.
 Identifiers: Computer analysis, Translations.

A system is described which uses simple rules for the treatment and storage of materials of clinical observations and physiological experiments. (Author)

AD-684 411 PC A02 MF A01
 Naval Civil Engineering Lab Port Hueneme Calif
Bamboo Reinforced Concrete Construction.
 Technical note
 Francis E. Brink, and Paul J. Rush. Feb 66, 21p Rept no. NCEL-TN-808

Descriptors: *Naval research, Reinforced concrete, Reinforcing materials, Fibers(Natural), Mixtures, Cements, Cracks, Moistureproofing, Mechanical properties.
 Identifiers: *Bamboo reinforced concrete.

This report has been prepared to assist field personnel in the design and construction of bamboo reinforced concrete. Comments on the selection and preparation of bamboo for reinforcing are given. Construction principles for bamboo reinforced concrete are discussed. Design procedures and charts for bamboo reinforced concrete are given and conversion methods from steel reinforced concrete design are shown. (Author)

AD-685 455 PC A02 MF A01
 Forest Products Lab Madison Wis
Natural Decay Resistance of Fifteen Exotic Woods Imported for Exterior Use.
 Forest Service research paper
 Joe W. Clark. Mar 69, 7p* Rept no. FSRP-FPL-103

Descriptors: *Wood, Degradation, Exposure, Classification, Sampling, Soils, Tropical deterioration, Structures, Atmospheric temperature, Fungus deterioration, Least squares method, Insects, Moisture.
 Identifiers: Heartwood.

An evaluation based on laboratory and field testing of the decay resistance of 15 species of wood, mostly tropical. (Author)

AD-685 824 PC A07 MF A01
 Army Engineer Waterways Experiment Station Vicksburg Miss
Expedient Reinforcement for Concrete for Use in Southeast Asia. Report 1. Preliminary Tests of Bamboo.
 Technical rept.
 Frank B. Cox, and Helmuth G. Geymayer. Feb 69, 139p Rept no. AEWES-TR-C-69-3-1

Descriptors: *Reinforced concrete, Reinforcing materials, Reviews, Organic materials, Feasibility studies, Tensile properties, Bonding, Degradation, Aging(Materials), Beams(Structural), Loading(Mechanics), Life expectancy.
 Identifiers: *Bamboo, Arundinaria tecta.

The report summarizes the preliminary results of a study of the feasibility of using bamboo as an expedient reinforcement for temporary, reinforced concrete structures. The report contains an extensive review of the literature, a description of the test procedures, results of an investigation of the most important engineering properties of bamboo, descriptions of tests of 26 bamboo-reinforced structural elements (20 simply supported beams with 6-ft (1.83-m) spans, and 6 simply supported two-way slabs of varying length, width, and depth), and conclusions and tentative recommendations for the design of bamboo-reinforced structures. (Author)

AD-686 717 HC A02 MF A01
 Forest Products Lab Madison Wis
Preservative Treatments for Protecting Wood Boxes.
 Forest Service research paper
 A. F. Verrall, and T. C. Scheffer. Apr 69, 10p* Rept no. FSRP-FPL-106

Descriptors: *Wood, Protective treatments, Containers, Preservation, Weatherproofing, Effectiveness, Storage, Exposure, Fungusproofing, Insects, Deterioration, Tropical regions, Life expectancy.
 Identifiers: Dip treatments, Boxes(Containers).

An evaluation of the effectiveness of three-minute dip treatments in various wood preservatives for wood boxes stored off the ground for more than 10 years in both a southern and a northern climate. (Author)

AD-686 759 HC A02 MF A01
 Research Analysis Corp McLean Va
Beyond de Gaulle.
 Howard C. Reese. Feb 66, 12p Rept no. RAC-P-16

Descriptors: *Political science, *France, Leadership, Attitudes, Group dynamics, Foreign policy, Interactions, Economics, Organizations, Communism, Predictions.
 Identifiers: DE Gaulle Charles.

The document speculates on what may take place in France after General de Gaulle leaves the scene. (Author)

AD-686 836 HC A04 MF A01
 Arizona Univ Tucson Inst of Arid Lands Research
Inventory of Research on Desert Regional Types.
 John R. Healy. 1968, 69p*

SELECTED APPROPRIATE TECHNOLOGIES

Contract DA-49-092-ARO-71
 Chapter 9 of Inventory of Geographic Research on Desert Environments. See also Chapter 8, AD-668 853.

Descriptors: *Deserts, Reviews, Scientific research, Classification, State-of-the-art reviews, Research program administration, Background, Geography, Environment, Terrain.
Identifiers: Desert regional types, Annotated bibliographies.

The purpose of the inventory is to determine in detail what topics have been or are being investigated for the world's deserts, to appraise the reported work, and to disclose areas of study where further work is needed. The series of chapters does not attempt to recapitulate all information known about the deserts of the world, but rather comprises a compendium-guidebook to past and present research. It is based upon a critical review of the published literature augmented by consultations with specialists. (Author)

AD-686 859 HC A02 MF A01
 Woods Hole Oceanographic Institution Mass
 influence of the Amazon River Outflow on the
 Ecology of the Western Tropical Atlantic. III.
 The Planktonic Flora Between the Amazon
 River and Windward Islands.
 Technical rept.
 E. M. Hulbert, and Nathaniel Corwin. 9 Oct 68,
 20p Rept nos. WHOI-Ref-69-22, WHOI-Contrib-
 2018
 Contract N00014-66-C-0241, Grant NSF-GB-861
 Sponsored in part by Atomic Energy Commission,
 Washington, D. C. See also AD-653 033.
 Availability: Pub. in Jnl. of Marine Research, v27 n
 p55-72 1969.

Descriptors: *Plankton, *Atlantic Ocean, *Rivers, Ecology, *Ecology, Plankton, Shallow water, Oceanographic data, Seacoast, Periodic variations, Continental shelves, Hydrographic surveying, Ocean bottom sampling, Salinity, Tropical regions, Surface properties, Temperature, River currents.
Identifiers: Amazon River, Phytoplankton.

An abundant diatomaceous flora was observed in shallow waters along the coasts of French Guiana and Dutch Guiana during the fall of 1964 and the spring of 1965. In the fall, these diatoms were apparently carried far beyond the continental shelf by the Amazon effluent, which crossed the northwestern Guiana Current and became entrained in a southeastward countercurrent. During both fall and spring, the oceanic species, predominantly cocolithophores, were adversely affected by the Amazon effluent. The uplifting of deep nutrient-rich water, which was observed along the edge of the continental shelf during both spring and fall, is apparently responsible for the abundance of diatoms in the coastal water. A similar enrichment also occurred offshore in the fall and may have helped to foster the minor flowerings of neritic species that had been seeded by cells transported from their more normal inshore habitat. Artificial flowerings were obtained by nutrient enrichment of water samples; growth was observed in only diatoms and the ubiquitous species, *Coccolithus huxleyi*. The many rarer oceanic species of cocolithophores did not respond to the artificial enrichment of the water, just as they had not responded to the natural enrichment existing in the coastal water and in the countercurrent during the fall. (Author)

AD-687 028 HC A02 MF A01
 National Academy of Sciences-National Research
 Council Washington D C Foreign Field Research
 Program
 Space, Change and Feng-Shui In Tsuen Wan's
 Urbanization.
 Baruch Boxer. 1968, 16p Rept no. 31A
 Contract Nonr-2300(09)
 Prepared in cooperation with Michigan State Univ.,
 East Lansing.
 Availability: Pub. in Jnl. of Asian and African Studies, v3 n3-4 p226-240 Jul/Oct 68.

Descriptors: *Urban planning, *Hong Kong, Urban areas, Population, Housing, Rural areas, Public opinion, Construction.

To write of 'change' in the context of Tsuen Wan's urbanization, is not simply a matter of describing the tangible evidence of urban growth or delimiting its parameters. Changes in population and area, mounting levels of capital investment and industrial production, fluctuations in land values, and other measurable indices of urbanization are descriptive of an essentially pragmatic response to the development plan which has defined the broad limits of urbanization. More significantly, the successful application of traditional Chinese conceptions of 'change' to the immediate demands of urbanization has facilitated a smooth transition to a modern urban-industrial society. (Author)

AD-687 318 HC A03 MF A01
 Rand Corp Santa Monica Calif
The Organizational Approach Versus the Societal Approach to Development in Emerging Nations.
 Paul T. McClure. May 69, 33p Rept no. P-4058

Descriptors: *Political science, *Management planning, Theory, Organizations, Sociometrics, Correlation techniques, Systems engineering, Problem solving, Decision making, Effectiveness.
Identifiers: *Developing countries, Public administration, Comparison.

Comparisons of public administrative systems on a national or regional level require much simplification, so that the descriptions and prescriptions which result may be too broad to be operational. The mission of the paper is to compare societal units with organizational units to determine which give a more appropriate focus point for analysis in order to achieve national development. (Author)

AD-695 631 HC A03 MF A01
 Arizona Univ Tucson
Contributions on the Status of Arid-Lands Research: Ground Water in Australia.
 Technical rept.
 Eugene S. Simpson. Aug 69, 31p ES-50
 Contract DAAG17-67-0199

Descriptors: *Deserts, Australia, *Water supplies, Deserts, Sandstone, Limestone, Thickness, Sedimentary rock, Porosity, Storage, Water, Minerals, Rainfall, Volume, Irrigation systems, Deposits, Sand, Water wells.
Identifiers: *Ground water, Aggregates(Materials), Artesian wells, Aquifers.

Essentially all exploitable ground water of the Australian arid zone is contained in the pore spaces of relatively flat-lying sandstones and limestones, which occur within the major sedimentary basins and cover about half of the arid-zone land surface. In each basin the aggregate thickness of the porous rocks is hundreds to thousands of feet, and they are interlayered with various rocks not bearing water, thus producing artesian or semiartesian conditions in many places. Although the quantity of stored water is immense, most of it accumulated during the past tens to hundreds of thousands of years; at least half of it is too mineralized for use in irrigation. The annual recharge from rainfall, though unknown in amount, is undoubtedly only a very small fraction of the amount in storage, and perhaps even less than the annual amount currently pumped from wells. Outside the sedimentary basins, small to moderate supplies of ground water may be obtained from fissures in the older crystalline rocks, or from relatively thin surficial deposits of unconsolidated sand, if the local water table is not deeper than the depth of fissures or the bottom of the sand. (Author)

AD-701 167 HC A08 MF A01
 Human Resources Research Organization Alexandria, Va
Planned Change in Agrarian Countries.
 Technical rept.
 Arthur H. Niehoff. Dec 69, 157p Rept no.
 HUMRRO-TR-69-21
 Contract DAHC19-70-C-0012

Descriptors: *Management planning, *Rural areas, Culture, Social communication, Economics, Agriculture, Sociology.

Identifiers: Agrarian countries, Social change, Ethnic groups, *Civic programs.

The report is an effort to provide operationally relevant concepts and guidelines for persons responsible for planning and implementing development projects in agrarian countries. A framework for describing or evaluating the conduct of development projects is proposed, and applied to the results of an analysis of 203 case studies of past projects. Influences, conditions, and techniques which appear to affect project outcome are: (1) local cultural characteristics, such as leader patterns, social structure, and economic patterns; (2) motivation for change, including felt needs and perceived practical benefits; and (3) project strategies, such as the innovator's image characteristics, communication, and participation. The case study analysis suggests that factors of special importance to success in development projects are cooperation of local leaders, degree and immediacy of practical benefits which recipients anticipate, innovator skill in communication processes, participation of recipients in implementing the change, and establishing arrangements for maintenance of the innovation by the local people. (Author)

AD-701 189 HC A03 MF A01
 Army Engineer Waterways Experiment Station Vicksburg Miss
Precast Concrete Elements with Bamboo Reinforcement.
 Technical rept.
 May 64, 28p Rept no. AEWES-TR-6-646

Descriptors: *Reinforced concrete, Experimental design, *Reinforcing materials, *Grasses, Tensile properties, Beams(Structural), Army research, Feasibility studies, Plants(Botany), Loading(Mechanics), Stresses, Test methods, Cracks.
Identifiers: Precast concrete, Bamboo.

The document covers investigation and tests of bamboo for use as reinforcing material in light emergency concrete constructions where steel is not available or economically justified, but bamboo and labor are available in quantity.

AD-703 222 HC A13 MF A01
 National Academy of Sciences-National Research Council Washington D C Foreign Field Research Program
Recent Historical Plant Geography of Martinique. I.
 Final rept.
 Clarissa Therese Kimber. Dec 69, 277p
 Contract N00014-67-A-0244-0001
 Continuation of Contract Nonr-2300(09). See also AD-703 223.

Descriptors: *Geography, Plants(Botany), *Mapping, Plants(Botany), *Lesser antilles, *Plants(Botany), Trees, Shrubs, Ecology, Selection, History, Classification, Identification, Terrain, Rock(Geology), Volcanoes, Mountains, Hydrology, Soils, Deserts, Grasses, Economics, Sociology, Maps, Tropical regions.
Identifiers: Martinique Islands, Rain forests, Forest plantations, Vegetation, Ornamental plants.

The report contains historical developments in the plant geography of the tropical French island of Martinique. Changing geographic patterns of vegetation and changing roles of those processes are discussed.

AD-703 223 HC A11 MF A01
 National Academy of Sciences-National Research Council Washington D C Foreign Field Research Program
Recent Historical Plant Geography of Martinique. II.
 Final rept.
 Clarissa Therese Kimber. Dec 69, 244p
 Contract N00014-67-A-0244-0001
 Continuation of Contract Nonr-2300(09). See also AD-703 222 and AD-703 224.

Descriptors: *Geography, Plants(Botany), *Mapping, Plants(Botany), *Lesser antilles,

SELECTED APPROPRIATE TECHNOLOGIES

*Plants(Botany), Trees, Agriculture, Swamps, Grasses, History, Regeneration, Rainfall, Shrubs, Fruits, Vegetables, Terrain, Seacoast, Maps, Tropical regions, Islands.
Identifiers: Martinique Island, Forest plantations, Rain forests, Ornamental plants, Vegetation.

In 1963 geographic patterns of vegetation for the island of Martinique West Indies were mapped at different scales. The report contains maps and historical sketches showing modifications in the agricultural system and technological changes.

AD-703 224 HC A13 MF A01
National Academy of Sciences-National Research Council Washington D C Foreign Field Research Program

Recent Historical Plant Geography of Martinique. III.

Final rept.

Clanassa Therese Kimber. Dec 69, 298p
Contract N00014-67-A-0244-0001
Continuation of Contract Nonr-2300(09). See also AD-702 223.

Descriptors: *Geography, Plants(Botany), *Mapping, Plants(Botany), *Lesser antilles, *Plants(Botany), Trees, Mountains, Shrubs, Terrain, Rainfall, Agriculture, Soils, Classification, Seacoast, Grasses, Vegetables, Fruits, Islands, History, Maps, Aerial photographs, Tropical regions.

Identifiers: *Martinique Island, Rain forests, Forest plantations, Ornamental plants, Vegetation.

In 1963 the actual geographic patterns of vegetation for the island of Martinique, West Indies, were mapped at different scales. The vegetation of the lower elevations was mapped completely and the mountain vegetation was sampled. Some 59 plant cover units were distinguished in the field for mapping which were classified into vegetation types and used in discussions of vegetation patterns.

AD-703 232 HC A19 MF A01
National Academy of Sciences-National Research Council Washington D C Foreign Field Research Program

Modernization In a Regional Context: Pretheory and Practice In Western Nigeria.

Final rept.

Thomas Harden Eighmy. Oct 69, 447p
Contract N00014-67-A-0244-0001
Prepared in cooperation with Wisconsin Univ., Madison, Dept. of Geography. Continuation of Contract Nonr-2300(09).

Descriptors: *Economics, *Nigeria, Reviews, Management planning, Environment, Agriculture, Commerce, Urban areas, Rural areas, Government(Foreign), Population, Roads, Communication systems, Factor analysis, Attitudes, Mathematical prediction.

Identifiers: Modernization.

Modernization, viewed in a regional setting, is a process resulting jointly in areal integration and differentiation. A conceptual spatial model of modernization is proposed. The arguments developed are applied to Western Nigeria in relation to the location of agricultural production, the development of a system of periodic food markets, and the unequal modernization of the large preindustrial Yoruba towns. Measurement of the spatial aspects of modernization is achieved through the use of principal components analysis with components scores, regression analysis with residuals, and trend surface fitting. (Author)

AD-703 235 HC A17 MF A01
National Academy of Sciences-National Research Council Washington D C Foreign Field Research Program

The Milk Supply of Major Indian Cities.

Final rept.

Richard A. Ellefsen. 1964, 386p
Contract N00014-67-A-0244-0001
Continuation of Contract Nonr-2300(09).

Descriptors: *Milk, Production, *Urban planning, *India, Food, Problem solving, Economics, Rural areas, Production control, Bovines, Terrain, Orga-

nizations, Predictions, Management planning, Distribution.
Identifiers: Demand(Economics), Delhi(India), Bombay(India), Madras(India), Calcutta(India).

The paper examines the milk industry in India in detail in order to point up its problems. The recent efforts towards improvement are assessed; an overview of the entire country is presented along with an intensive examination of the present and potential milk-supplying hinterlands for Delhi, Bombay, Madras, and Calcutta. Emphasis throughout the work is on the areal and locational aspects of the milk supply. (Author)

AD-703 884 HC A18 MF A01

Arizona Univ Tucson Inst of Arid Lands Research
Desert Research: Selected References 1965-1968.

Technical rept.

Patricia Paylore, and W. G. McGinnies. Dec 69, 419p* ES-52
Contract DAAG17-67-C-0199

Descriptors: *Deserts, *Bibliographies, Plants(Botany), Mammals, Climatology, Hydrology, Seacoast, Economics, Geography, Social sciences, Agriculture, Geology, Ecology, Tropical regions, Abstracts.

Identifiers: Landforms, Geomorphology, Ground water.

The report consists of a selection of 1,094 references (many of which are annotated) to worldwide desert literature for the period 1965-1968, together with an appendix of 385 references published before 1965, with the emphasis on vegetation, fauna, geomorphology and surface hydrology, weather and climate, surface materials, geohydrology, regional geography, and desert coastal areas, as well as a limited number dealing with various aspects of the human, cultural, economic, and political geography of deserts. Titles have been permuted to provide an index of significant keywords. (Author)

AD-704 160 HC A03 MF A01
McGill Univ Montreal (Quebec) Dept of Geography
The Savanna Landscapes of the Amazon Basin.

Technical rept. on Savanna Research Project
Theo L. Hills. Jul 69, 50p Rept nos. TR-15,
Savanna Research Series-14
Contract Nonr-3855(00)

Descriptors: *Plants(Botany), Distribution, *Climatology, *British Guiana, Classification, Trees, Rainfall, Ecology, Soils, Moisture, Grasses, Shrubs, Swamps, Tropical regions, Forest fires, Rivers, Canada.

Identifiers: *Savanna landscapes, Amazon River, Vegetation.

The following hypothesis is presented and defended. Climate is a predisposing factor, not a determining factor. Climate, characterised as it is in many parts of the Amazon Basin by a distinctive dry season of up to seven months in length, as in the Rupununi-Rio Branco region, often makes the presence of tropical rain forest problematical and predisposes the environment towards the development of savanna vegetation. Low soil fertility and laterite are frequently considered as prime determinants of savanna vegetation but here they are considered as features associated with savanna landscapes, especially on senile, pediplanated surfaces. Occasionally they may be resultant factors, as when the nutrient cycle is broken after the disappearance of forest cover. Fire, which is also frequently considered a prime determinant, is generally a maintaining factor, but in limited areas may be causal, in the sense that it is immediate in chronological terms. The stage of geomorphic evolution and the dominant geomorphic processes in the landscape are those factors which most directly influence the position and behaviour of the water table, the soil moisture regime, the soil nutrient cycle, the ecoclimates of the region and thus, the distribution of forest and savanna. (Author)

AD-704 261 HC A04 MF A01
Forest Products Lab Madison Wis

Properties of Imported Tropical Woods.

Forest Service research paper
B. Francis Kukachka. Mar 70, 69p* Rept no. FSFSR-FPL-125

Presented at the Conference on Tropical Hardwoods, State University College of Forestry, Syracuse Univ., 18-21 Aug 69.

Descriptors: *Wood, Physical properties, *Tropical regions, Wood, Classification, Machinability, Shrinkage, Flexural strength, Statistical data, Mechanical properties.

Identifiers: Heartwoods, Sapwoods.

Descriptions are of more than 100 tropical genera and generic groups of wood are provided, with emphasis on properties that affect their utilization. Botanical names, common names, and principal growth areas are included. (Author)

AD-706 398 HC A02 MF A01

Smithsonian Institution Washington D C
Ecology, Epidemiology, Distribution and Abundance of Flying Vertebrates of Tropical delta Forest Environments.

Final rept. Nov 67-21 Aug 69

Philip S. Humphrey. 21 Aug 69, 4p AFOSR-70-1408TR
Grant AF-AFOSR-1407-68

Descriptors: *Birds, Tropical regions, Epidemiology, Ecology, Distribution, Morphology(Biology), Reproduction(Physiology), Parasites, Mites, Ticks, Arboviruses, Infections, Brazil.

Field work at the Guama Ecological Research Area on the outskirts of Belem, Brazil, continued through 21 August 1969. The data consist of information on birds captured with mist nets in three tropical forest environments: high ground (terra firme) forest, igapo or permanent swamp forest, and riverine or varzea swamp forest which is flooded by tidally induced fluctuations of the river level. The following information was recorded: band number, weight and amount of subcutaneous fat, indications of reproduction such as brood patches or cloacal protuberances, detailed notes on molt if any, sex, age, presence or absence of Trombiculid mites, number of ticks if any, net number, shelf of net in which bird was captured, time, soft part colors if necessary for subsequent sexing and aging, degree of skull ossification and color of excrement if this might provide clues as to food habits. Generally a small blood sample was taken and a blood smear made. The smear was for later examination for haemoparasites. The blood sample was used for virus isolation and then tested for antibodies to eighteen different arboviruses by a haemagglutination-inhibition test, or tested for antibodies against one of three viruses including St. Louis Encephalitis by a neutralization test in tissue culture.

AD-707 560 HC A03 MF A01

Hebrew Univ Jerusalem (Israel) Dept of Sociology
Innovation, Social Exchange, and Institutionalization.

Final scientific rept.

S. N. Eisenstadt. 15 Feb 70, 42p AFOSR-70-1634TR
Grant AF-EOAR-23-67

Descriptors: *Culture, Group dynamics, *Social psychology, Pattern recognition, Organizations, Attitudes, Interactions, Urban areas, Rural areas, India, Western Europe, Latin America, Communism.

Identifiers: Developing countries, Status segregation, Intelligentsia.

A summary report is made on a comparative study of the conditions under which innovation and change are accepted in developing nations. It is shown that major determinants of status segregation as over against status association does not lie in socio-demographic factors but in the relation between status group and control center (government). Different types of status segregation are closely correlated with their access to and 'distance' from the central control; while increase in class association is correlated with the degree of participation in 'center' formation. These patterns

SELECTED APPROPRIATE TECHNOLOGIES

are illustrated by comparative analyses of Asian and Latin American countries. (Author)

AD-709 715 HC A09 MF A01

Army Research Office Durham N C

Optimum Subsurface and Underground Shell Structures for Better Housing In Hot-Arid Lands. Part I: A Case for Subsurface and Underground Housing in Hot-Arid Lands. Part II: Optimization of Subsurface and Underground Shells.

Interim technical rept. no. 1

Sudhir Kumar, and Jason Cheng-Chuan Shih.

Apr 70, 179p*

Research in Some Aspects of Fluid and Solid Mechanics.

Descriptors: *Underground structures, Structural shells, *Housing, Underground structures, Reviews, Construction materials, Numerical analysis, Tropical regions.

Identifiers: *Subsurface housing, *Underground housing.

This report consists of two distinct parts. A case was made for subsurface and underground housing in hot-arid lands in Part I. This includes discussions of environmental conditions, past developments of subsurface housing, new conceptual designs for dwellings, apartments, complexes of large and multiple buildings and transportation tunnels, etc. Part II of the report presents analytical optimization of subsurface cylindrical shells and completely underground shells, with a view to keep at a minimum the quantity of material used in the shells. The subsurface cylindrical shells are optimized by limit analysis, whereas the optimum shape and thickness distribution of the underground shells is determined by elastic analysis. Shapes of several shells have been determined as examples and design charts for general use have been prepared for all these shells. (Author)

AD-709 718 HC A02 MF A01

Forest Products Lab Madison Wis

Natural Decay Resistance of 30 Peruvian Woods.

Forest Service research paper

T. L. Highley, and T. C. Scheffer. Jul 70, 6p*

Rept no. FSRP-FPL-143

Descriptors: *Wood, *Fungus deterioration, *Peru, Wood, Tropical deterioration, Exposure, Damage, Wear resistance, Weight, Classification, Resistance(Biological), Statistical data, Test methods.

Identifiers: Hardwoods, Decay resistant wood.

Thirty Peruvian species of possible commercial significance were evaluated by soil-block testing for resistance to decay fungi. The tests indicated that 25 percent of the species would be resistant or highly resistant for use in contact with the ground and that 50 percent of the species would be resistant or highly resistant for use above ground. Decay resistance was found to be substantially correlated with the specific gravity of the various species. (Author)

AD-714 914 PC A09 MF A01

Army Foreign Science and Technology Center Washington D C

Excerpts from Treatments for Textile Materials.

P. A. Simigin, M. N. Zusman, and F. I. Raikhlin. 16 Jun 70, 186p Rept no. FSTC-HT-23-613-70 Trans. of mono. Zashchitnye Propiti Tekstilnykh Materialov, Moscow, 1957.

Descriptors: *Cellulose, *Fungus deterioration, *Fungus proofing, Cellulose, *Textiles, Fungus proofing, *Fungicides, Cellulose, *Moistureproofing, Textiles, *Fire resistant textiles, Manufacturing methods, Cotton textiles, Photochemistry, Micro-organisms, Copper compounds, Chromium compounds, Test methods, Chromates, USSR. Identifiers: *Tanning materials, *Biodeterioration, Translations.

The book describes methods of treatment giving cellulose materials resistance to the effects of micro-organisms (to rotting), and giving fabric

made of cellulose fibers water repellent and fire-resistant properties, and also preventing the development of moths on silk materials. The book also presents modern methods of testing these treated materials. (Author)

AD-715 802 PC A08 MF A01

Pennsylvania State Univ University Park

The Impact of Modernization In the Philippines II.

Technical rept. no. 2

George M. Guthrie. Aug 67, 174p

Contract Nonr-656(37), ARPA Order-855

Prepared in cooperation with Ateneo de Manila (Republic of the Philippines). See also Technical rept. no. 1, AD-656 122, and Technical rept. no. 3, AD-689 868.

Descriptors: *Philippines, Economics, *Anthropology, Philippines, Industries, Fishes, Food, Culture, Children, Personality, Linguistics.

Identifiers: *Modernization, *Economic development.

Contents: The fishing industry of Estancia, Iloilo; Cultural differences in the use of guilt and shame in child rearing; a review of the research on the Philippines and other non-western societies; The antecedents and correlates of aiding responses: a review of the literature; and Cognitive mapping in the Tagalog area.

AD-715 871 PC A07 MF A01

Duke Univ Durham N C

Weight and Energy Values of Selected Litter-Fall Components from Two Forest Stands In the Canal Zone Republic of Panama.

Final rept. 5 May 67-4 Nov 70, 0 10 Frank W. / Woods

1970, 127p AROD-7382:2-EN

Grant DA-ARO(D)-31-124-G938

Descriptors: *Forestry, *Panama, *Plant tissue, Sampling, Weight, Trees, Deposits, Shrubs, Degradation, Energy, Moisture, Ecology, Site selection, Tropical regions.

Identifiers: *Forest litter, Vegetational decay.

Weights of selected plant parts and species composing litter fall were measured for more than one year in two forest stands in the Canal Zone. One stand was on the Caribbean side, the other on the Pacific. Seasonal values for kilograms and kilocalories per hectare were computed. (Author)

AD-716 235

Chicago Univ Ill Dept of Geography

Rural Markets and Trade in East Africa. A Study of the Functions and Development of Exchange Institutions In Ankole, Uganda.

Research paper

Charles M. Good. 1970, 272p RP-128, NAS-NRC-FFRP-39

Contract Nonr-2300(09)

Prepared in cooperation with San Fernando Valley State Coll.

Availability: Paper copy available from The University of Chicago, Dept. of Geography, 1101 E. 58th St., Chicago, Ill. 60637. \$4.50. No copies furnished by DDC or NTIS.

Descriptors: *Economics, Subsaharan Africa, *Commerce, *Subsaharan Africa, Organizations, Rural areas, Reviews, Distribution(Economics), Classification, Statistical data, Behavior, Factor analysis.

Identifiers: Ankole(Uganda), *Uganda, Developing countries, *East Africa, Exchanging.

The study is organized into two parts, the first of which is concerned with the nature of the Ankole market system in 1968. It begins with an overview of the survey area, including a discussion of field procedures and methods, by a typology of markets, a comparative analytical profile of African traders based on some 900 interviews, and an analysis of the spatial behavior of market consumers. Part 2 endeavors to place the contemporary marketing system in historical perspective. (Author)

AD-716 403

PC A02 MF A01

Yale Univ New Haven Conn School of Forestry **Moisture Absorption In Certain Tropical American Woods (Revised).**

Technical rept.

M. R. Samborski, G. T. Tsoumis, and Frederick F. Wanggaard. 1 Jun 49, 20p Rept no. TR-8 Contract N6ori-44

Descriptors: *Wood, Moisture, Salts, Water, Distribution, Test methods, Statistical data, Absorption. Identifiers: *Tropical woods.

The report supplements and summarizes an earlier one of the same title and covers a study undertaken as part of a continuing investigation of the properties of tropical woods. The purpose of this particular phase of the research program was to determine the amount of absorbed moisture and its distribution pattern when wood is submerged in salt water. Data on 25 tropical American species were presented in the original report and are now supplemented by similar data on 18 additional species. Burma Teak, White Oak, and Douglas Fir were included for comparison, and summary ratings for all 46 species, based on side-grain and over-all moisture absorption, are included. (Author)

AD-716 740

PC A03 MF A01

Naval Research Lab Washington D C **Biological Deterioration of Wood In Tropical Environments. Part 2. Marine Borer Resistance of Natural Woods over Long Periods of Immersion.**

Final rept.

C. R. Southwell, J. D. Bultman, B. W. Forgeson, and C. W. Hummer. 7 Dec 70, 47p Rept no. NRL-7123

See also Part 1, AD-653 856.

Descriptors: *Wood, Degradation, *Tropical deterioration, Wood, *Marine borers, Wood, Resistance(Biological), Sea water, Identification, Tropical regions, Crustacea, Mollusca, Panama, Trees.

Identifiers: Teredo, Pholad, Limnoria, Panama Canal Zone, Biological deterioration.

One hundred and fifteen wood species have been exposed to marine borers in three different tropical waters for periods up to 90 months. Underwater sites were in the Panama Canal Zone and included two oceans and a brackish-water lake. Over 30 species of marine-boring organisms were identified from these waters; their extreme activity in the warm tropical environments provided a very thorough screening test for the woods. Samples have been evaluated separately for resistance to the three principal borer classes—teredo, pholad, and limnoria. Several of the woods were resistant to one or more of the borer types. Some of these resistant species are relatively unknown as marine construction timbers, and in some instances they proved to be more durable than Greenheart, Teak, and other commercial marine woods. The species most resistant to all borers was Dalbergia retusa (Cocobolo), whose oily extract may provide leads to a satisfactory wood preservative. The woods most resistant to each of the different classes of borers are tabulated, with their respective silica content and density included. Silica was shown to be significant only in relation to teredine borers, while wood density was important only with pholads. Woods considered to be of special interest because of findings in the study are discussed individually. (Author)

AD-717 965

PC A07 MF A01

Bermuda Biological Station St George'S West Primary and Secondary Production In the Tropical Atlantic

Final rept. Aug 67-Sep 69

David M. Steven, Albert L. Brooks, and Euna A. Moore. Dec 70, 132p

Contract N00014-67-A-0432-0001

Prepared in cooperation with Bellairs Research Inst., St. James (Barbados), McGill Univ., Montreal (Quebec). Marine Sciences Centre, and University of the West Indies (Barbados), Dept. of Biology. See also AD-614 791.

Descriptors: *Ecology, *Atlantic Ocean, Plankton, Salinity, Fertility, Nutrition, Sea water, Chemical

SELECTED APPROPRIATE TECHNOLOGIES

properties, Chlorophylls, Aquatic animals, Periodic variations.

Identifiers: *Primary biological productivity, *Biological productivity.

Forty-eight collections were made for a study of primary and secondary production at a station in 460 m of water, between 29 August 1967 and 1 September 1969, and 22 additional collections at 17 deep water stations within a radius of 100 miles from Barbados. Primary production by carbon fixation lacked seasonal variation and annual production was estimated at 117 g C /sq m/year. Predictable seasonal variations were also lacking in concentrations of nutrients and in the composition and quantity of phytoplankton and zooplankton. However evidence was obtained of oscillations with a two to four months' periodicity in the concentration of chlorophyll and the numbers of *Trichodesmium*, which is the most important phytoplankton of the surface waters. This is tentatively ascribed to a short term growth and decay cycle which may be determined by grazing by zooplankton. Additional information was obtained on an inverse correlation between salinity and silicate concentration in the surface water previously reported. The low salinity/high silicate water found off Barbados at various times from January to August appears to originate with the Amazon River outflow and is identified with the fresh water lenses some 500 miles to the east of the island. (Author)

AD-720 097 PC A02 MF A01

Naval Oceanographic Office Washington DC
Biology and Distribution of the Yellowfin Tuna In the Tropical Part of Atlantic Ocean (Biology I Raspadelenie Zhetoperogo Tunta (Neothunnus albacora Lowe) v Tropiccheskoi Chasti Atlanticheskogo Okeana)

V. L. Zarov, and Yu. A. Torin. 1971, 14p Rept no. NOO-Trans-468
Trans. of Atlanticheskii Nauchno-Issledovatel'skii Institut Rybnogo khozyaistva i Okeanografii. Trudy (USSR) v11 p27-35 1964, by M. Slessers.

Descriptors: *Fishes, Distribution, *Marine biology, *Atlantic Ocean, Abundance, Exploration, Volume, Sea water, Surface temperatures, Salinity, Phosphates, Seacoast, Tropical regions, South America, Africa, USSR.
Identifiers: Translations, *Tunas, Salt water fishes, *Animal migrations, Neothunnus albacora.

The paper discusses the Soviet observations of tuna fishes which were carried out in the coastal belt of S America, W Africa and the tropical zone of the Atlantic Ocean during 1959-1962. Since the species consists of two distinct groups, larger and smaller tunas, the distribution, migration and concentrations of these groups are charted separately, pointing out the hydrological conditions that favor the concentrations of these fishes, i.e., the upwelling, convergence and divergence belts, variations of water temperature, salinity and phosphorus content. (Author)

AD-722 000 PC A02 MF A01

Pennsylvania State Univ University Park
The Impact of Modernization in The Philippines
Final technical rept.
George M. Guthrie. Jan 70, 12p
Contract Nonr-656(37), ARPA Order-855
Prepared in cooperation with Ateneo de Manila Univ., Philippines.

Descriptors: *Philippines, Economics, Reviews, Agriculture, Rural areas, Radio equipment, Jet planes, Television communication systems, Roads, Industries, Education, Police.
Identifiers: *Developing countries, Surveys, *Economic development, Modernization.

The report gives a brief summary of the findings of some 34 individual papers which had come from this project as of the end of the contract period. It includes also a brief summary of the collaborative effort between Penn State and Ateneo de Manila University in carrying out and publishing these various papers. Major findings include pervasive social patterns of leveling which tend to diminish the benefit to individuals of innovative efforts but, at the same time, spread the risk of losses. The traditional way of life is maintained because it

offers more security than ways which might be considered more modern. These general patterns emerged strongly in studies of farmers, fishermen and market vendors. Other studies were concerned with nutritional status in rural areas and with factors which maintained a level of nutrition in which growth and resistance to infection were adversely affected. Still other studies were concerned with the persistence of traditional patterns in social organization of government structures, particularly the police. (Author)

AD-723 062 PC A09 MF A01

Arizona Univ Tucson Inst of Arid Lands Research

Desert Research, II: Selected References 1966-1970

Technical rept.

Patricia Paylore. Sep 70, 177p* ES-60

Contract DAAG17-67-C-0199

See also report dated Dec 69, AD-703 884.

Descriptors: *Deserts, *Bibliographies, Stratigraphy, Erosion, Wind, Climatology, Plants(Botany), Animals, Structural geology, Hydrology, Tropical regions, Micrometeorology, Geography, Soils, Irrigation systems, Agriculture, Water supplies, Desert tests, Abstracts.
Identifiers: Landforms, Geomorphology, Hydrogeology.

The report consists of 594 references to worldwide desert literature appearing between 1966 and 1970, as located during the period January 1969 to August 1970 in standard abstracting and indexing tools, by continuing searches in sources not so indexed, and by a worldwide network of direct contacts. It is arranged alphabetically by authors, with a brief index of subject geographic terms. Brief abstracts are included, with emphasis on arid lands aspects of such topics as geomorphology, weather and climate, vegetation, fauna, surface materials, hydrology, and geography. (Author)

AD-727 713 PC A02 MF A01

Air Univ Maxwell AFB Ala Arctic Desert Tropic Information Center
Plant Sources of Water in Southeast Asia

Aug 69, 11p Rept no. ADTC-Information Bull-7-A

Descriptors: *Plants(Botany), *Southeast Asia, *Water, Sources, Instruction manuals, Survival, Identification, Site selection, Tropical regions.

Topics include: How to tap a tree; Cutting water vines; Descriptive data on thirst quenchers.

AD-728 482 PC A03 MF A01

Smithsonian Institution Washington DC
Ecology of a Tropical Delta Forest Environment. I. Introduction

Final rept. Jan 66-Jun 71
Philip S. Humphrey. Jun 71, 28p AROD-7184:1-EN-Pt-1
Grant DA-ARO(D)-31-124-G896, DA-ARO(D)-31-124-G1086

See also Part 2, AD-728 483 and Part 4, AD-728

Descriptors: *Ecology, *Jungles, *Tropical regions, Ecology, Trees, Brazil, Environment, Distribution, Meteorology, Distribution, Plants(Botany).
Identifiers: *Guama Ecological Research Reserves.

A program of studies on the ecology and epidemiology of tropical forest environments in the Guama Ecological Research Reserves near Belem, Brazil, was initiated January 1966 and is still underway. The Guama Ecological Research Reserves comprise approximately 340 hectares and include the following tropical forest environments: the terra firme forest, varzea swamp forest, igapo swamp forest and second growth forest. Each of the reserves was subdivided into 10 x 10 meter numbered quadrats in terms of which data were collected for the following: soils, meteorology, botany, mycology, entomology, terrestrial vertebrates, and arthropod-borne viruses (including the vertebrate hosts and arthropod vectors). The present report includes: discussion of method of data collection,

analysis and interpretation; description of the Guama Ecological Research Reserves; analysis of the tree vegetation of the Reserves; analysis of the distribution of birds, amphibians, and lizards in the tropical forest environment of the Reserves; and analysis of the arthropod-borne virus epidemiology of the Reserves. (Author)

AD-728 483 PC A03 MF A01

Smithsonian Institution Washington DC
Ecology of a Tropical Delta Forest Environment. II. The Guama Ecological Research Reserves

Final rept. Jan 66-Jun 71

Philip S. Humphrey. Jun 71, 28p AROD-7184:1-EN-Pt-2

Grant DA-ARO(D)-31-124-G896, DA-ARO(D)-31-124-G1086

See also Part 1, AD-728 482 and Part 3, AD-728 484.

Descriptors: *Ecology, *Jungles, *Tropical regions, Ecology, *Metereology, Tropical regions, Environment, Climatology, Temperature, Humidity, Brazil, Plants(Botany), Maps.

Identifiers: *Guama Ecological Research Reserves.

Contents:

Facilities of the Guama Ecological Research Reserves;
Meteorology of the Guama Ecological Research Reserves.

AD-728 484 PC A04 MF A01

Smithsonian Institution Washington DC
Ecology of a Tropical Delta Forest Environment. III. Vegetation of the Guama Ecological Research Reserves

Final rept. Jan 66-Jun 71

Philip S. Humphrey, and William H. Hatheway.

Jun 71, 71p AROD-7184:1-EN-Pt-3

Grant DA-ARO(D)-31-124-G896, DA-ARO(D)-31-124-G1086

See also Part 2, AD-728 483 and Part 4, AD-728 485.

Descriptors: *Ecology, *Jungles, *Tropical regions, Ecology, Trees, Brazil, Environment, Distribution, Meteorology, Distribution, Plants(Botany).
Identifiers: *Guama Ecological Research Reserves.

Contents:

Preliminary analysis of the tree vegetation of the Mocambo Reserve;
Analysis of the tree vegetation of the Aura, Catu, and Mocambo Reserves;
The tropical forest environments.

AD-728 485 PC A04 MF A01

Smithsonian Institution Washington DC
Ecology of a Tropical Delta Forest Environment. IV. Birds and Forest Environments in the Guama Ecological Research Reserves

Final rept. Jan 66-Jun 71

Philip S. Humphrey, and William H. Hatheway.

Jun 71, 63p AROD-7184:1-EN-Pt-4

Grant DA-ARO(D)-31-124-G896, DA-ARO(D)-31-124-G1086

See also Part 3, AD-728 484, and Part 5, AD-728 486.

Descriptors: *Ecology, *Jungles, *Tropical regions, Ecology, Birds, Tropical regions, Plants(Botany), Distribution, Environment, Maps, Disease vectors, Brazil.
Identifiers: *Guama Ecological Research Reserves.

Contents:

Contingency table analysis of birds in the Guama Ecological Research Reserves;
Distributions of bird species in relation to vegetational ordinations.

AD-728 486 PC E01 MF A01

Smithsonian Institution Washington DC

SELECTED APPROPRIATE TECHNOLOGIES

Ecology of a Tropical Delta Forest Environment. V. Diversity and Abundance Patterns of Lower Amazonian Rain Forest Birds
Final rept. Jan 66-Jun 71

Thomas E. Lovejoy. Jun 71, 218 AROD-7184:1-EN-Pt-5
Grant DA-ARO(D)-31-124-G896, DA-ARO(D)-31-124-G1086
See also part 4, AD-728 485 and Part 6, AD-728 487.

Descriptors: *Ecology, *Jungles, *Tropical regions, Ecology, *Birds, Tropical regions, Meteorology, Distribution, Plants(Botany), Classification, Environment, Brazil.
Identifiers: *Guama Ecological Research Reserves.

Bird communities in four types of rain forest on the outskirts of Belem, Brazil were studied using capture-recapture data collected from all levels of the forests from 1967 to 1969. During the course of the study about 15,000 bird captures were made. Diversity indices of the data demonstrate these to be some of the most diverse avian communities. Extremes of abundance and rarity seem to decrease in bird communities with increasing numbers of species. Vertical stratification and the presence of between-habitat diversity is demonstrated. The more similar the tree species composition around two groups of nets, the more similar is the species composition of the birds caught in those two groups of nets. Despite the presence of between-habitat diversity, there is considerable overlap in abundant bird species between various forest types. Tropical rain forests and their bird communities have special properties which make generalization from temperate situations difficult. This is shown by the high diversity and low equitability of Belem forest birds, the superiority of tree species composition to foliage height diversity as a predictor of bird species composition, and the high overlap in abundant bird species between forest types.

AD-728 487 PC A08 MF A01
Smithsonian Institution Washington DC
Ecology of a Tropical Delta Forest Environment. VI. Quantitative Analysis of the Ecological Distribution of a Tropical Herpetofauna
Final rept. Jan 66-Jun 71
Martha L. Crump. Jun 71, 153p AROD-7184:1-EN-Pt-6
Grant DA-ARO(D)-31-124-G896, DA-ARO(D)-31-124-G1086
See also Part 5, AD-728 486 and Part 7, AD-728 488.

Descriptors: *Ecology, *Jungles, *Tropical regions, Ecology, *Amphibians, Tropical regions, *Reptiles, Tropical regions, Distribution, Genetics, Physiology, Morphology(Biology), Environment, Adaptation(Physiology), Brazil.
Identifiers: *Herpetology, *Guama Ecological Research Reserves.

The ecological distribution of each of 62 species of frogs, salamanders, and lizards was determined by means of continuous sampling throughout the environment from mid-January to the end of July, 1969, two weeks in April 1970, and June-July, 1970. Each species exhibits a characteristic distribution, according to its genetic, morphological, and physiological make-up, its life cycle, its way of relating to the physical environment, and its interactions with other species.

AD-728 488 PC A10 MF A01
Smithsonian Institution Washington DC
Ecology of a Tropical Delta Forest Environment. VII. APEG Epidemiology Program-1966 through March 1970
Final rept. Jan 66-Jun 71
John P. Woodall. Jun 71, 221p AROD-7184:1-EN-Pt-7
Grant DA-ARO(D)-31-124-G896, DA-ARO(D)-31-124-G1086
See also Part 6, AD-728 487.

Descriptors: *Ecology, *Jungles, *Tropical regions, Ecology, *Arboviruses, Tropical regions, Brazil, Epidemiology, Viruses, Mammals, Birds,

Culicidae, Entomology, Ticks, Mites, Disease vectors, Virus diseases, Distribution, Parasites, Culex. Identifiers: *Guama Ecological Research Reserves.

There is a large number of pathogenic arboviruses enzootic in forests of the APEG reserves. Transmission of these viruses by mosquitoes increases during periods of increased rainfall, between the birds and small mammals. Note that 5 arboviruses apparently new to science have been isolated from APEG material. These are: BeAn 84381 and BeAn 153564 of the Capim group, from sentinel mice, wild rodents and mosquitoes; BeAn 141106 (un-grouped) from a wild bird; BeAn 157575 (Kwatta group), also from wild birds; and BeAn 116382 (Guama group) from sentinel mice. Also 29 species of ectoparasitic trombiculid mites new to science have been described from material collected in APEG.

AD-730 939 PC A03 MF A01
Harvard Univ Cambridge Mass East Asian Research Center
Production Brigade and Team Management
John C. Pelzel. 5 Oct 71, 35p AFOSR-TR-71-2624
Contract AF 49(638)-1399

Descriptors: *Management engineering, Production, *China, Management engineering, Rural areas, Agriculture, Labor.

The report is based on case studies of management practices of twenty rural production teams belonging to one production brigade in southern Kwangtung and Fukien provinces. It describes the way in which Production Brigade and Teams were organized and managed, and the produce distributed. (Author)

AD-731 719 PC A04 MF A01
California Univ Berkeley Structural Engineering Lab
Solving the Galvanic Cell Problem in Ferro-Cement
Interim technical rept.
Kenneth A. Christensen, and Robert Brady Williamson. Jul 71, 67p Rept nos. UCSESM-71-14, TR-2
Contract N00014-69-A-0200-1007
Report on Structures and Materials Research.

Descriptors: *Reinforced concrete, *Corrosion, *Electrolytic cells, Reinforced concrete, Cements, Steel, Reinforcing materials, Inhibition, Barrier coatings, Additives, Chromium compounds, Oxides, Construction materials.
Identifiers: *Ferrocement, Galvanic corrosion, Chromium oxides.

The nature and constitution of ferro-cement is reviewed with special reference to the structure of cement paste. The microstructure of low water-to-cement ratio pastes is presented in schematic illustrations to show that a thin paste layer can be used to protect steel reinforcing material from a marine environment. A galvanic cell between the plain steel reinforcing bar and the galvanized steel mesh ordinarily used in ferro-cement is identified. This galvanic cell gives off hydrogen gas at the plain steel reinforcing bar which leads to poor bonding. Possible solutions to this problem are presented and one, the use of chromium trioxide (Cr_2O_3) in the mix water, is shown to solve the problem most effectively. This leads to improved mechanical properties as well as a sounder barrier to corrosion of the reinforcement. (Author)

AD-740 285 PC A03/MF A01
Army Engineer Waterways Experiment Station Vicksburg Miss
Design, Analysis, and Construction of Precast Concrete Elements with Bamboo Reinforcement

Eugene F. Smith, and Kenneth L. Saucier. Feb 65, 35p Rept no. AEWES-Misc-Paper-6-705

Descriptors: *Reinforced concrete, Design, *Wood, Reinforced concrete, *Structures, Reinforced concrete, Grasses, Tropical regions, Loading(Mechanics), Deflection, Flexural strength,

Feasibility studies, Military requirements, Beams(Structural), Aging(Materials), Tests. Identifiers: *Bamboo reinforced concrete, *Precast concrete.

The purpose of the research program was to study the feasibility of using bamboo as the reinforcing material in precast concrete elements in tropical and semi-tropical countries. The objectives were to: (1) modify current ultimate strength design and area-moment procedures, as necessary, so that ultimate moments and deflections of bamboo-reinforced concrete elements can be reasonably estimated, and (2) to determine the load-carrying capabilities and deflection limitations of precast concrete flexural elements with bamboo reinforcement under both short-term and sustained loads.

AD-743 436 PC A02/MF A01
Army Engineer Waterways Experiment Station Vicksburg Miss
Design, Analysis, and Construction of Precast Concrete Elements with Bamboo Reinforcement
Kenneth L. Saucier, and Eugene F. Smith. Sep 67, 20p Rept no. AEWES-Misc-Paper-6-926

Descriptors: *Structural parts, *Reinforced concrete, *Reinforced concrete, Wood, Loading(Mechanics), Design, Feasibility studies, Structural properties, Military engineering. Identifiers: *Bamboo, Precast concrete.

The purpose was to study the feasibility of using bamboo as the reinforcing material in precast concrete elements. The objectives were to: (1) determine the load-carrying capabilities and deflection limitations of precast concrete flexural elements with bamboo reinforcement under both short-term and sustained loads; and (2) modify current ultimate strength design and area-moment procedures, as necessary, so that ultimate moments and deflections of bamboo-reinforced concrete elements can be reasonably estimated. (Author)

AD-744 691 PC A03/MF A01
Forest Products Lab Madison Wis
FPL (Forest Products Laboratory) Designs Meet Family Housing Needs
Forest Service research paper
G. E. Sherwood. 1972, 30p* Rept no. FSRP-FPL-173

Descriptors: *Housing, Design, Construction, Construction materials, Wood, Foundations(Structures), Costs, Rural areas, Questionnaires. Identifiers: *Low cost housing, *Rural housing.

The Forest Products Laboratory (FPL) has developed five house plans for low-cost rural houses to demonstrate cost-saving principles of construction. The plans feature simplicity of design, but provide structurally sound houses that fulfill the needs of many families. A questionnaire was mailed to 1,620 individuals who requested and were sent the FPL plans during 1969. A total of 1,129 responded. The replies indicated that 225 houses had been built and that 318 houses were planned for future construction. Ninety-three percent of the reported costs were less than \$12,000; 92 percent indicated incomes of less than \$7,000. In general, the survey results show that structurally sound houses can be built to meet the needs of low-income families at prices they can afford to pay. (Author)

AD-746 489 PC A02/MF A01
Northwestern Univ Evanston Ill Dept of Biological Sciences
Control of Flies and Cockroaches by Insect Hormones
Annual rept. no. 1, 1 Aug 71-31 Jul 72
Lawrence I. Gilbert. 10 Aug 72, 13p
Contract N00014-67-A-0356-0024

Descriptors: *Insect control, *Hormones, *Blattidae, Insect control, Blood proteins, Chemical bonds, Labeled substances, Muscidae, Chromatographic analysis, Metabolism, Biochemistry. Identifiers: *Cockroaches, Juvenile hormones, Dopamine, Cuticle, Tanning materials.

SELECTED APPROPRIATE TECHNOLOGIES

The research described deals with two subjects; hormone receptors in insects and the tanning of the insect cuticle. If either process can be interfered with, one would have an effective means of insect control. Receptor studies using sucrose density gradient ultracentrifugation demonstrated the existence of two protein receptors in the crustacean hepatopancreas that bind label from 3H-ecdysone (molting hormone). Microchemical analysis demonstrated that the label was now due to a previously undescribed ecdysone metabolite. Experiments with the lipoidal juvenile hormone showed that a specific hemolymph (blood) lipoprotein binds 14C-juvenile hormone. Using column chromatography, electrophoresis, and immunological procedures, the author has shown that 14C-dopamine (a central compound in tanning of the cuticle) is metabolized by two different routes in the tobacco hornworm. The immunochemical and radiotracer studies demonstrate for the first time that these hemolymph carrier proteins do indeed traverse the epidermal cell to make their way unaltered into the cuticle undergoing tanning. (Author)

AD-748 582 PC A03/MF A01
Naval Civil Engineering Lab Port Hueneme Calif
Flexural Strength of Ferro-Cement Panels
Technical rept.
J. E. Tancreto, and H. H. Haynes. Aug 72, 38p*
Rept no. NCEL-TR-772

Descriptors: *Reinforced concrete, Flexural strength, Panels(Structural), Steel, Wire, Reinforcing materials, Fracture(Mechanics), Composite materials.
Identifiers: *Ferrocement.

The report studies ferro-cement panels reinforced with plain steel woven wire mesh and subjected to flexural loads to determine the first cracking, visible cracking, and ultimate strength properties. The reinforcement variables were mesh size (which ranged from 2 x 2 to 14 x 14 wires/in.), wire diameter (which ranged from 0.011 to 0.041 inch), and percentage of steel (which ranged from 1 to 3% by area in the direction of principal stress). Control panels of unreinforced mortar and panels reinforced with chicken wire or steel rods were also tested. (Author)

AD-749 272 PC A03/MF A01
Applied Scientific Research Corp of Thailand Bangkok

Tropical Environmental Data (Trend): Cooperative Research Programme Number 27. Ecosystem Study of Tropical Dry-Evergreen Forest. Report number 1. Primary Production In Dry-Evergreen Forest at Sakaerat Amphoe Pak Thong Chai, Changwat Nakhon Ratchasima. I. Estimation of Biomass and Distribution Amongst Various Organs

Sanga Sabhasri, Choob Khemnark, Sanit Aksornkoae, and Padoem Ratisoonthorn. 1968, 40p
See also AD-749 273.

Descriptors: *Forestry, Tropical regions, *Rainfall, Thailand, Trees, Micrometeorology, Shrubs, Deterioration, Organic materials, Weight, Statistical data, Ecology.

Identifiers: *Dry-evergreen forests, *Biomass, Biological productivity.

The present investigation is part of an ecosystem study of a dry-evergreen forest at the Sakaerat Experiment Station in Amphoe Pak Thong Chai, Changwat Nakhon Ratchasima in the north-eastern region of Thailand. This report is concerned with an initial examination of the biomass (weight of living plant material), as one step in assessing the primary productivity in the forest. Estimates of primary productivity in various habitats throughout the world are of major importance in relation to the global potential for food production. (Author)

AD-749 273 PC A02/MF A01
Applied Scientific Research Corp of Thailand Bangkok

Tropical Environmental Data (Trend): Cooperative Research Programme Number 27. Ecosystem Study of Tropical Dry-Evergreen Forest. Report number 2. Structure and Floristic Composition of Forest Vegetation at Sakaerat, Pak Thong Chai, Nakhon Ratchasima. I. Variation of Floristic Composition along a Transect through Dry-Evergreen and Dry Dipterocarp Forests

Sanga Sabhasri, Ath Boonnatee, Choob Khemnark, and Sanit Aksornkoae. 1968, 25p
See also AD-749 272.

Descriptors: *Forestry, Tropical regions, *Rainfall, *Thailand, Plants(Botany), Ecology, Sampling, Organic materials, Terrain, Statistical data, Classification.

Identifiers: Dry-evergreen forests, Plant communities, Vegetation.

As part of an ecosystem study of dry-evergreen forest and associated dry dipterocarp forest at the Sakaerat Experiment Station in Amphoe Pak Thong Chai, Changwat Nakhon Ratchasima, in north-eastern Thailand, it has been decided to examine the structure and floristic composition of various parts of the forests and to attempt to relate observed variations to various environmental and ecological factors. (Author)

AD-750 351 PC A02/MF A01
Army Natick Labs Mass
Disposal of Cellulosic Waste Materials by Enzymatic Hydrolysis
Mary Mandels, Lloyd Hontz, and Dixon Brandt. 1972, 16p*

Descriptors: *Cellulose, *Decomposition, *Enzymes, Cellulose, Disposal, Wastes(Industrial), Wastes(Sanitary engineering), Glucose, Hydrolysis, Production, Fungi, Cotton, Paper, Wood.

Identifiers: *Biodegradation, *Waste disposal, *Solid waste disposal, Celluloses, Bagasse, Rice hulls, Agricultural wastes, Trichoderma viride.

The paper summarizes studies on pollution abatement by enzymatic conversion of waste cellulose to useful products. Cellulose is the major component of card board boxes, kraft paper, paper bags, correspondence paper, and newsprint, or any other product of wood pulp or cotton. One approach has been the direct conversion of cellulose to animal protein by ruminant feeding, or to single cell protein by growing bacteria or fungi on cellulose. The authors' approach has been a different one. Cellulose was converted to glucose by acid or enzymatic hydrolysis.

AD-753 455 PC A05/MF A01
Naval Personnel and Training Research Lab San Diego Calif

Design and Fleet Trial of Automated Performance Evaluation Forms for Two Pay Grade Groups: E5-E6 and E1-E4
Research rept.

David W. Robertson, Marjorie H. Royle, and Jim James. Nov 72, 76p Rept no. SRR-73-11

Descriptors: *Naval personnel, Performance(Human), *Performance(Human), Reports, Wages, Reading machines, Design, Automation.

Identifiers: Performance evaluation.

Alternative marking scales and coding procedures for each pay grade group were experimentally administered to a fleet sample. Two alternative Optical Character Reader (OCR) forms, a mark-sense and a character-sense mode, were used to test the automated capability. All experimental forms provided distributions of marks substantially more discriminating than the present operational form, especially for the Pay Grade 5-6 group. Of special concern was the inflationary and stultifying effect of the present coding procedure, even on the new forms. Preparation time, discrepancy rate, and processing time were much higher for OCR and OMR type documents. Specific recommendations are provided for substantially improving both the source document design and the system design. (Author)

AD-755 424 PC A03/MF A01
Naval Ship Research and Development Center Bethesda Md
Comparison Study of Aluminum, Ferro-Cement, and Fiber-Reinforced Plastic for Small Craft in Korea
Benjamin Whang. Dec 72, 37p Rept no. NSRDC-3979

Descriptors: *Hulls(Marine), Materials, *Aluminum alloys, Hulls(Marine), *Reinforced concrete, Hulls(Marine), *Reinforced plastics, Hulls(Marine), Boats, Glass textiles, Polyester plastics, Physical properties, Costs, Abundance, Manufacturing methods, South Korea, Maintenance.
Identifiers: *Ferrocement, *Fiber composites.

The work compares aluminum, ferro-cement, and fiber-reinforced plastic in terms of small boat construction costs, strength-stiffness/weight characteristics, maintenance, fatigue, impact resistance, fire resistance, etc. within the framework of present day Korean technology and economics. (Author)

AD-755 815 PC A03/MF A01
Cold Regions Research and Engineering Lab Hanover N H
Icebergs as a Fresh Water Source: An Appraisal
Research rept.
W. F. Weeks, and W. J. Campbell. Jan 73, 32p*
Rept no. CRREL-RR-200

Descriptors: *Ice islands, *Water supplies, Site selection, Melting, Drag, Feasibility studies, Irrigation systems, Deserts, Transportation, Towed bodies, Sea ice, Water traffic, Antarctic regions.

Identifiers: Icebergs, Arid land, Fresh water.

A history of the idea of transporting large icebergs to arid regions to provide a fresh water source is presented and the problem is considered in four main parts: Locating a suitable supply of icebergs; Calculating the power requirements necessary to transport the icebergs to a location where fresh water is needed; Calculating the amount of ice that will be melted in transit; and, Estimating the overall economic feasibility of the venture. This paper is a preliminary look at each of these aspects of the problem.

AD-758 524 Not available NTIS
Pennsylvania State Univ University Park
A Right to Survive: Subsistence Marketing In a Lowland Philippine Town
Maria Cristina Blanc Szanton. Dec 72, 178p
Contract Nonr-656(37), ARPA Order-855
Library of Congress Catalog Card no. 72-157769.
International Standard Book no. 0-271-00555-6.
Availability: Paper copy available from Pennsylvania State University Press, University Park, Pa. \$8.00.

Descriptors: *Economics, *Philippines, *Commerce, Analysis, Food, Logistics, Sociometrics, Rural areas, Behavior, Management planning.
Identifiers: Developing countries, Estancia(Philippines), *Subsistence marketing, Economic development, SD.

A comprehensive analysis is made of the movement of food and supplies from their sources, through middlemen, to consumers in the public market-place of Estancia, Iloilo, a town of 15,000 people located on the northeastern corner of Panay Island in the Philippines. An insight into the social and economic operations of this marketing process-extrapolated to underdeveloped countries throughout the world-suggests action programs for coping effectively with the impediments to progress which lie in many present production and marketing patterns. (Author Modified Abstract)

AD-758 604 Reprint
Malaya Univ Kuala Lumpur (Malaysia) School of Biological Sciences
Phenology of a Tropical Rain Forest in Malaya
Lord Medway. May 72, 35p ARDG(FE)-312
Grant DA-CRD-AFE-S92-544-67-G80
Availability: Pub. in Biological Jnl. of the Linnean Society, v4 n2 p117-146 Jun 72.

SELECTED APPROPRIATE TECHNOLOGIES

Descriptors: *Tropical regions, Forestry, *Malaya, *Plants(Botany), Periodic variations, Rain, Humidity, Jungles.
Identifiers: Canopy trees, Flowering, Fruiting, Foliar activity, Tropical rain forests, Selangor(Malaysia), A.

During 1960-69, observations were made of flowering, fruiting and foliar activity of 61 canopy trees (representing 45 species) in a largely undisturbed tract of Hill Dipterocarp Forest. Rainfall was measured by an accumulating gauge and, at a nearby station, the number of rainy days recorded. Annually recurrent floral cycles were displayed by only ten species. In these and in 11 additional species, foliar cycles were also circannual. Gregarious flowering, apparently in response to drought, occurred in many species in 1963 and 1968. In other years, interspecific differences in periodicity maintained a minimal incidence of flowering at 44%, and fruiting at 27% of species in the sample. Despite specific variations in phenology, the community as a whole exhibited regular seasonality, with single annual peaks of flowering and fruiting and a double peak of leaf production. (Author)

AD-765 616/8 PC A03/MF A01
 Army War Coll Carlisle Barracks Pa
Administrative Aspects of Urbanization In Developing Countries
 Monograph
 Eugene R. Brady, 20 Mar 72, 31p

Descriptors: *Management planning, *Urban areas, *Government(Foreign), Problem solving, Management engineering, Organizations, Dynamics, Urban planning, Reviews, Analysis, Natural resources.
Identifiers: *Urbanization, *Developing countries, Policies, Participative management, A.

The report deals primarily with administrative problems associated with urbanization in developing countries. Approaches to these problems are discussed in the following areas: organizational structures and relationships, management of resources, participation and representation, urban plans and policies, and institutional aids. (Author)

AD-772 930/4 PC A02/MF A01
 Army Natick Labs Mass
The Acceptability of Whey-Soy Mix as a Supplementary Food for Pre-School Children In Developing Countries
 Technical rept.
 W. I. III Rodier, W. C. Wetsel, H. L. Jacobs, R. C. Graeber, and H. R. Moskowitz, Dec 73, 21p*
 Rept no. USA-NLABS-TR-74-20-PR

Descriptors: *Milk, *Food, *Children, Acceptability, Beverages, Army research.
Identifiers: Developing countries, A.

Testing of a whey-soy beverage powder was carried out in Chile, Vietnam, India, Pakistan, Sierra Leone and the Dominican Republic to determine its probable acceptability for use as a supplementary food for pre-school children. Test results indicated that the beverage powder should be acceptable in all test countries except possibly Sierra Leone. Moreover, since the tests were carried out in a variety of geographical areas and cultures and in several types of distribution systems, it may be concluded that there is a high probability that the beverage powder will be acceptable in pre-school child feeding programs in most parts of the developing world.

AD-781 403/1 PC E05/MF A01
 Naval Postgraduate School Monterey Calif
Fatigue of Ferro-Cement
 Master's thesis
 Michael G. Simpson, Jun 74, 119p

Descriptors: *Reinforced concrete, *Fatigue(Mechanics), Ship hulls, Stresses, Test methods, Fracture(Mechanics), Electron microscopy, Theses.
Identifiers: *Ferrocement, *Wire cloth, Scanning electron microscopy.

Ferro-cement is a cement mortar with a high relative volume of well dispersed steel wire reinforcement. The material properties of ferrocement are neither those of the mortar alone nor of the reinforcement and vary as the mortar and reinforcement configurations are changed. In this study, several variations of ferro-cement were fabricated and subjected to constant amplitude cyclic loads up to ten million cycles. Stress versus cycles-to-failure plots were developed and comparisons between the data for various ferro-cement modifications were made. Monotonic tests were conducted on the ferro-cement to allow comparisons with work conducted by other experimenters. An investigation of the fracture surface was conducted using a scanning electron microscope. (Author)

AD-782 199/4 PC A04/MF A01
 Asian Inst of Tech Bangkok (Thailand)
Investigation of Rational Effluent and Stream Standards for Tropical Countries
 Annual rept. 1 Nov 71-30 Apr 73
 Mainwaring B. Pescod, 28 May 74, 61p ARDG/FE-476-2
 Grant DA-RDRF-S92-544-72-G179

Descriptors: *Water pollution, *Water supplies, *Streams, *Southeast Asia, Standards, Quality, Irrigation systems, Sewage treatment, Drinking water, Oxygen, Fishes, Oxidation, Waste water, Costs, Thailand.
Identifiers: *Water quality standards, Oxidation la-goons, Developing countries.

Water quality standards were reviewed and tentative stream standards proposed for use in developing countries of Southeast Asia on the basis of legitimate water uses and adaptation of available data to local conditions. A survey of stream standards and water uses applied in the Southeast Asian region indicated that few countries had adopted standards and practically no attempt had been made to adjust to suit local conditions. Experimental studies suggested that oxidation pond effluent would have a beneficial effect on the oxygen balance of a stream under tropical conditions provided that the algal concentration was not more than 10,000 cells/ml after dilution in the stream. Oxidation ponds were assessed as being more attractive than either trickling filter or activated sludge treatment plants for populations less than 175,000 and land rental costs of U.S. \$0.10 per square meter per year or less. (Author)

AD-785 748/5 PC A03/MF A01
 Trinity Coll Dublin (Ireland) School of Engineering
Investigation of Stress Concentration In Reinforced Concrete Components
 Final technical rept. 1 Jun 73-31 May 74
 T. E. Glynn, and M. Z. Al-Salihi, Jun 74, 26p
 Grant DA-ERO-591-73-G-0041

Descriptors: *Reinforced concrete, *Stresses, Static tests, Dynamic tests, Crack propagation, Formulations, Ireland.
Identifiers: *Ferrocement.

This report is a continuation of the former efforts to elucidate the behavior of ferrocement concrete in static and dynamic stress fields. The influence of various reinforcements on pre and post cracking of thin sections forms the main topic of this report. The objects of the testing program were to compare the effectiveness of various steel mesh configurations in arresting crack propagation in stressed members; to provide experimental data for checking theoretical predictions of strength based on material parameters; to identify areas of future research potential. The work to date has been devoted to flexural and direct tensile tests on thin slabs. The slabs were reinforced uniformly with steel meshes of various patterns. The matrix consisted of microconcretes, and some variations in the mix design were incorporated.

AD-785 928/3 PC A03/MF A01
 Romualdi (James P) Pittsburgh Pa
Ferrocement Developments in New Zealand
 James P. Romualdi, May 74, 36p
 Contract N00167-74-C-0171

Descriptors: *Ship hulls, *Boats, *Cements, Production, New Zealand.
Identifiers: *Ferrocement.

During the period August 1973 to January 1974, the author was associated with a local firm which is engaged in marine and terrestrial ferrocement activities. These activities provided an opportunity to assess the potential of ferrocement as well as the undertaking of tests of new hull construction techniques that combine ferrocement with steel fiber reinforced mortar. This report summarizes current development, assesses current potential of the material, presents the results of the test series, and ends with recommendations for future development. This report does not attempt to review the general state-of-the-art of ferrocement hull construction.

AD-787 465/4 PC-GPO/MF A01-NTIS
 Department of the Army Washington DC
Africa: A Bibliographic Survey of Literature 1973, 623p* Rept no. DA-PAM-550-17
 Availability: Paper copy available from GPO.

Descriptors: *Africa, *Bibliographies, Handbooks, Political science, Sociology, Economics, Military forces(Foreign), Military organizations, Transportation, Communication and radio systems, Literature surveys.
Identifiers: Developing countries.

Like the previous volume on the subject (DA PAM 550-5) which was issued in April 1967, the new edition endeavors to assess the problems and prospects in the vast continent. The difficulties and accomplishments are looked at from both-a broad, regional point of view, as well as from a specific, national point of view. The work includes data on the strategic importance of Africa as a continent, and also provides facts and figures on the political, sociological, economic, and military aspects that contribute to the viability of individual African states. More than four thousand books, periodical articles, and monographs, were searched in the preparation of this work. The body of material is supported by 91 appendixes and 53 maps, of which 18 are in color.

AD-831 713 PC A02 MF A01
 Michigan Univ., Ann Arbor. Inst. of Science and Technology
Vesiac Monthly Bulletin of Vela Uniform Research Publications.
 15 Feb 68, 15p Rept no. VESIAC Bull-61

Descriptors: *Seismology, Reports, Seismological stations, Epicenter, Nuclear explosions, Earthquakes, Networks, Underground explosions, Bibliographies, Propagation, Magnetohydrodynamics, Periodicals, Scientific research, Phased arrays, Seismometers, Abstracts, Seismic waves.
Identifiers: Vela Uniform, Mantle(Earth), Seismic noise.

The report contains VESIAC Monthly Bulletin of reports from VELA UNIFORM Seismological Research Publications with abstracts. (Author)

AD-837 454/8 PC A02/MF A01
 Army Biological Labs Frederick MD
Rice Cultivation In North Vietnam
 27 Jul 65, 16p Rept no. Trans-1498
 Trans. of mono. Futsuryo Indo Shina Nogyo Keizai (Agricultural Economy in Indochina) Tokyo, 1942 p1-14.
 Distribution limitation now removed.

Descriptors: *Cereals, Vietnam, Rural areas, Rivers, Soils, Plants(Botany), Seeds, Production, Statistical analysis, Irrigation systems, Agriculture.
Identifiers: North vietnam, Rice, Translations.

The report discusses rice culture in North Vietnam. Varieties of rice, soils and regional characteristics of rice culture are examined.

AD-837 489/4 PC A02/MF A01
 Army Biological Labs Frederick MD

SELECTED APPROPRIATE TECHNOLOGIES

Notes on the Duration of Evolution of Varieties of Rice Cultivated in Indochina
 Yves Coyaud. Jul 68, 14p Rept no. Trans-1443
 Trans. from Agronomie Tropicale (France) v3 n5-6
 1948.
 Distribution limitation now removed.

Descriptors: *Cereals, Vietnam, Rural areas, Plants(Botany), Climate, Transplantation, Soils, Acclimatization, Economics, Terrain, Irrigation systems, Agriculture.
 Identifiers: Rice, Translations.

The report discusses the varieties of rice grown in present day Vietnam. Influence of soils, climate and plant strains upon rice production are examined.

AD-837 490/2 PC A02/MF A01
 Army Biological Labs Frederick MD
Conditions of the Culture of Rice in the High-Dongal (Vietnam)
 P. Bertrand. 1952, 18p Rept no. Trans-1444
 Trans. of Agronomie Tropicale (France) v7 n3 p266-275 1952.
 Distribution limitation now removed.

Descriptors: *Cereals, Vietnam, Commerce, Rural areas, Forestry, Seeds, Plants(Botany), Soils, Manpower, Climate, Irrigation systems.
 Identifiers: Rice, Translations.

The report discusses the more primitive agricultural practices of the mountain peoples of Vietnam. The methods of rice culture, forest clearing and soil preparation are examined.

AD-837 491/0 PC A02/MF A01
 Army Biological Labs Frederick MD
Work That the Indochinese Rice Office Has Accomplished
 Paul Carton. 1955, 10p Rept no. Trans-1445
 Trans. of Riz et Riziculture et Cultures Vivrieres Tropicales (France) v1 n1 p26-29 1955.
 Distribution limitation now removed.

Descriptors: *Cereals, Vietnam, Rural areas, Southeast Asia, Research management, Plants(Botany), Agriculture.
 Identifiers: Rice, Translations.

No abstract available.

AD-837 492/8 PC A02/MF A01
 Army Biological Labs Frederick MD
Production and Distribution of the Rice Seeds in Vietnam
 1956, 5p Rept no. Trans-1446
 Trans. of Riz et Riziculture et Cultures Vivrieres Tropicales (France) v2 n4 p309-310 1956.
 Distribution limitation now removed.

Descriptors: *Cereals, Vietnam, Rural areas, Seeds, Production, Plants(Botany), Research management, Agriculture.
 Identifiers: Rice, South Vietnam, Translations.

No abstract available.

AD-837 495/1 PC A02/MF A01
 Army Biological Labs Frederick MD
Some Aspects on the Production of Rice Problem in Vietnam
 1960, 12p Rept no. Trans-1448
 Trans. of Causeries Development Resources Nat. Vietnam Soc. Etat. Agr. (sic) n12 p9-22, 5 Oct 60.
 Distribution limitation now removed.

Descriptors: *Cereals, Vietnam, Commerce, Rural areas, Fertilizers, Seeds, Economics, Irrigation systems.
 Identifiers: Rice, South Vietnam, Translations.

The report discusses rice growing in South Vietnam. Commercial, export and technical problems are discussed as well as means for increasing crop yields.

AD-837 496/9 PC A03/MF A01
 Army Biological Labs Frederick MD

The Problem of Fertilizers in Rice-Growing in South Vietnam
 Doan Khac Vuong. 1952, 40p Rept no. Trans-1450
 Trans. from Indochinese Rice Office. Archives (sic) n36 1952.
 Distribution limitation now removed.

Descriptors: *Cereals, Vietnam, Rural areas, Production, Climate, Seeds, Soils, Chemical analysis, Fertilizers, Plants(Botany), Research management, Agriculture.
 Identifiers: Rice, South Vietnam, Translations.

The report presents a study of the practices concerning use of fertilizers in the rice growing zones of South Vietnam. The present and recommended uses of fertilizers are discussed.

AD-837 497/7 PC A02/MF A01
 Army Biological Labs Frederick MD
Campaign for Improvement in Cooperative Management - Second Stage
 Ha Dang. 23 Jun 65, 4p Rept no. Trans-1500
 Trans. of Khoa Hoc Ky Thuat Nong Hghep (sic) (North Vietnam) p22-23, 15 Nov 63.
 Distribution limitation now removed.

Descriptors: *Management planning and control, Agriculture, *Agriculture, Vietnam, Food, Cereals, Swine, Rural areas, Propaganda, Communism, Political science, Fertilizers, Seeds, Irrigation systems.
 Identifiers: North Vietnam, Rice, Translations.

The report discusses ways of improving food production in a small North Vietnamese cooperative farm.

AD-878 676/6 PC A03/MF A01
 Naval Ship Research and Development Lab Annapolis MD
State-of-the-Art Survey of Ferrocement
 Research and development rept.
 Frank E. Brauer. Jan 71, 38p Rept no. NSRDL/A-8-529
 Distribution limitation now removed.

Descriptors: *Cements, *Reinforced concrete, *Composite materials, Cements, *Construction materials, Ships, Wire, Reinforcing materials, Tensile properties, Flexural strength, Modulus of elasticity, Fatigue(Mechanics), Compressive properties, Shear stresses, Corrosion resistance, Impact shock, Mechanical properties, Shock resistance, State-of-the-art reviews, Cracks, Ductility, Steel, Bonding, Corrosion inhibition.
 Identifiers: *Ferrocement, Portland cement.

From this literature study it was found that ferrocement is a composite material of superior mechanical properties when compared to reinforced concrete. This superiority is reflected in greater flexural crack strength, tensile strength, ductility, and impact strength. Much more research into the material properties of ferrocement must be done to fully understand the nature of the strengthening mechanism in ferrocement and to provide designers with comprehensive, reliable information necessary for the maximum utilization of ferrocement. (Author)

ANL-77-25 PC A07/MF A01
 Argonne National Lab., Ill.
Final Report of Fuel Dynamics Test E7
 R. C. Doerner, W. F. Murphy, G. S. Stanford, and P. H. Froehle. Apr 77, 150p
 Contract W-31-109-ENG-38

Descriptors: *Excursions, *Fuel element failure, *Lmfbr type reactors, Flow blockage, Meltdown, Transients.
 Identifiers: ERDA/220900, ERDA/210500.

Test data from an in-pile failure experiment of high-power LMFBR-type fuel pins in a simulated \$3/s transient-overpower (TOP) accident are reported and analyzed. Major conclusions are that (1) a series of cladding ruptures during the 100-ms period preceding fuel release injected small bursts of fission gas into the flow stream; (2) gas release influenced subsequent cladding melting and fuel

release (there were no measurable FCI's (fuel-coolant interactions), and all fuel motion observed by the hodoscope was very slow); (3) the predominant postfailure fuel motion appears to be radial swelling that left a spongy fuel crust on the holder wall; (4) less than 4 to 6 percent of the fuel moved axially out of the original fuel zone, and most of this froze within a 10-cm region above the original top of the fuel zone to form the outlet blockage. An inlet blockage approximately 1 cm long was formed and consisted of large interconnected void regions. Both blockages began just beyond the ends of the fuel pellets. (ERA citation 03:018089)

AWRE-O-41/74 PC A02/MF A01
 UKAEA Weapons Group, Aldermaston. Atomic Weapons Research Establishment.
Pandit: A Fortran IV Program to Produce an Adjusted Nuclear Data Input Tape.
 K. Dugan. Oct 74, 13p
 U.S. Sales Only.

Descriptors: *Nuclear data collections, *Data processing, *Computer codes, *P codes, Cross sections, Fortran, Group constants, Ibm computers, Multigroup theory, Neutrons, United Kingdom.

For abstract, see NSA 31 05, number 12750.

BMFT-FB-T-77-06 PC A04/MF A01
 Dornier-System G.m.b.H., Friedrichshafen (West Germany).
Glue Stock from Leather Production. Final Report
 K. Purps. Jul 77, 55p
 U.S. Sales Only.

Descriptors: *Industrial wastes, *Leather, Economics, Environmental effects, Processing, Recycling, Waste processing.
 Identifiers: ERDA/320305, West Germany, *Solid waste disposal, *Tanneries, Waste recycling, Hides.

The low-collagen, limed inner hide layer obtained in tanneries is not recommended for reuse in the hide gluing industry both from the economic and the environmental standpoint. Therefore, it is proposed to have the flesh removed from the unlimed raw hide in the slaughterhouses. The tanneries are thus relieved of their burden of waste discharge, and the animal carcass-rendering companies can benefit from an additional valuable raw material. (ERA citation 03:031271)

BMI-1957(V.3) PC A09/MF A01
 Battelle Columbus Labs., Ohio.
Systems Study of Fuels from Sugarcane, Sweet Sorghum, and Sugar Beets. Volume III. Conversion to Fuels and Chemical Feedstocks. Task 77. Final Report
 E. S. Lipinsky, R. A. Nathan, W. J. Sheppard, and J. L. Otis. 31 Dec 76, 183p
 Contract W-7405-ENG-92

Descriptors: *Ammonia, *Chemical feedstocks, *Ethanol, *Furfural, *Sugar cane, Acetic acid, Acid hydrolysis, Anaerobic digestion, Bagasse, Biosynthesis, Comparative evaluations, Cost, Economics, Fermentation, High btu gas, Industrial plants, Liquids, Residues, Thermochemical processes.
 Identifiers: ERDA/140504, ERDA/090222, ERDA/090122, ERDA/090320, *Refuse derived fuels.

Information developed in field interviews and literature research which form the basis of extensive calculations that pertain to numerous alternative means of converting the sugar crops into fuels and chemical feedstocks is reported. Investigation of numerous candidate fuels and chemical feedstocks that might be made from sugar crops indicates that ethanol and ammonia are the most promising. The projected cost of ethanol by use of well-established fermentation technology on juice extracted from sugarcane or on molasses is expected to be quite close to that projected for ethanol from natural gas liquids or petroleum by 1980. The ammonia market is substantial (17 million tons), but this key fertilizer and chemical product is expected to cost close to \$200 per ton when made from sugar crop residues, well above what ammonia made from natural gas at \$3 per million Btu

SELECTED APPROPRIATE TECHNOLOGIES

costs. However, sugarcane-based ammonia might compete well with coal-based ammonia. Sugarcane appears to be the most promising sugar crop for conversion to fuels and chemicals in the short and intermediate term. The costs of sugarcane juice and bagasse are lower than for the corresponding sugar beet products. Of the sugar crops, sweet sorghum has the greatest long-range appeal for the United States because the crop can grow over a much wider geographical range than can sugarcane. The development of processes to manufacture ammonia, methanol, acetic acid, and thermochemical substitute natural gas (SNG) from sugar crop residues depends on technology to generate synthesis gas. Sugarcane bagasse appears to be the most economic source of furfural. Anaerobic digestion of sugarcane or sugar-containing juices to SNG is ruled out on economic grounds. The principal findings of the conversion aspects of the research are summarized quantitatively. Alternative routes for conversion of sugar crops to fuels and chemicals are presented. (ERA citation 03:006207)

BNL-20510 PC A02/MF A01
Brookhaven National Lab., Upton, N.Y.
Energy Institute for Developing Countries: A Working Paper.
P. F. Palmedo, and R. Nathans. May 74, 12p

Descriptors: *Developing countries, Energy sources, *Energy sources, Planning, *Energy policy, Charges, Distribution, Economic development, Energy supplies, Forecasting, Production, Simulation.
Identifiers: ERDA/293000, ERDA/292500, ERDA/293800.

The volatility of energy prices, as well as the precariousness of international energy supply, is forcing many developing countries to consider new ways to satisfy their energy needs over the next several decades. As a result it is likely that major changes in energy production - distribution systems will occur in large numbers of these countries. A necessary component of the important decisions these countries must make, e.g., with respect to changes in plans for their economic development or the introduction of new technologies, is the need to assess the alternatives and plan for their country's current and future energy needs. This working paper discusses the establishment of an Energy Institute for Developing Countries, whose major function would be to assist and work with interested countries in the performance of energy planning and assessment analyses. Other areas to be covered by the Institute include: (1) preparation of methodologies for evaluation and assessment of new technologies for individual countries; (2) generation of data bases of technical coefficients; (3) provision of user manuals, training of technical personnel and extensive consultations with appropriate government officials in developing countries; and (4) support to agencies and organizations in the U.S. concerned with energy problems in developing countries. The paper discusses the need for and characteristics of a comprehensive energy planning and assessment framework, and a scheme for micro and macro assessments of alternative energy technologies. It also lists a series of specific mechanisms for developing appropriate models and data bases, and transferring the results to interested developing countries.

BNL-21491 PC A02/MF A01
Brookhaven National Lab., Upton, N.Y.
Single Technology Pitfall
J. G. Cottingham. 1976, 9p Rept no. CONF-760657-1
Contract E(30-1)-16
New England solar energy conference, Amherst, Massachusetts, United States of America (USA), 24 Jun 1976.

Descriptors: *Solar energy, *Tower focus collectors, Cost, Economic development, Solar collectors.
Identifiers: ERDA/140300.

As a first step toward cost reduction six principles are suggested to enhance the solar energy cost picture: use solar energy as a supplement; find a

year round application for your collector system; reduce the material content per unit area of collector; generate higher temperatures - make better use of second law of thermodynamics; develop commercial size air conditioning units first for economy; and adapt solar energy to current energy handling technology. The "baby power tower" collector at Brookhaven is sketched and used to illustrate these principles. (ERA citation 02:033915)

BNL-21874 PC A02/MF A01
Brookhaven National Lab., Upton, N.Y.
Brief Description of the Developing Country Energy Project
1 Oct 76, 7p
Contract EY-76-C-02-0016

Descriptors: *Developing countries, *Energy demand, *Energy supplies, Economics, Energy storage systems, Socio-economic factors, Systems analysis, Technology assessment.

Identifiers: ERDA/292000, ERDA/293000, India, Kenya, Ghana, South Korea, Chile, Brazil, Greece, Energy models.

The objective of the project is to assess the role of new or adapted technologies in addressing the energy problems of developing countries. This objective is pursued through activities ranging from historical economic analyses of the role of energy in development to assessments of individual technologies carried out in support of research and development planning. The project, started in 1975, carries a particular emphasis on the energy problems and technologies appropriate to rural development. A firm tenet of the activity is, however, that the role of individual energy technologies can be understood only through an integrated view of the entire energy system and the way in which that system meshes with the economic and cultural structure of a society. The entire group of LDCs are being examined to develop a better understanding of the role of energy in development and to project the energy requirements of those countries under alternative growth patterns. Some representative countries were used as the basis for generic energy technology assessment. Seven countries were chosen as an initial set for analysis based on their representing a range of levels of development, climate, resource base, etc. These countries were India and Kenya (in the low, less than \$200 per capita, income group) Ghana and South Korea (in the intermediate income group), and Chile, Brazil and Greece (in the upper, greater than \$550 per capita, income group). In constructing energy supply-demand models for these countries, emphasis was placed on incorporating data on noncommercial energy use wherever such information was available. (ERA citation 02:013794)

BNL-22311 PC A02/MF A01
Brookhaven National Lab., Upton, N.Y.
Role of Renewable Energy Technologies In Developing Countries
P. F. Palmedo. 10 Jan 77, 11p
Contract EY-76-C-02-0016

Descriptors: *Developing countries, *Energy source development, *Technology utilization, Efficiency, Energy consumption, Energy sources, Financing, Global aspects, Planning, Recommendations, Research programs.
Identifiers: ERDA/299000.

Some of the implications of the choice between renewable, decentralized technologies and non-renewable, centralized technologies as applied to developing countries are presented. The focus on developing countries does not imply that the choice is not a pertinent one for developed countries, but only that it is a particularly pressing one for the lesser-developed countries. In order to clarify the significance of the distinction between renewable and depletable resources, two qualifications are made. The resource and its feasible system to use that resource is of primary interest. Sunlight is free but the devices to use that resource may require a rare metal, which then makes the use of solar energy not renewable. The second qualification is that some resources that are finite such as deuterium as used in fusion reactors have such large abundance that they can be considered

renewable. Some specific steps that can be taken to give renewable energy resources an opportunity to compete on a more equal footing with conventional fossil and nuclear technologies in the LDCs are: stimulate and support energy planning in developing countries; include appropriate technology in developed country R and D programs; and develop and demonstrate technologies in the LDCs. These activities would represent no financial burden to the developed world. A realistic appraisal of potential renewable resources to meet the future energy needs of developing countries is important. (ERA citation 02:039519)

BNL-23340 PC A03/MF A01
State Univ. of New York at Stony Brook.
Energy Planning and Management In Developing Countries: Thoughts Concerning a Conceptual Framework
R. Nathans, and P. F. Palmedo. 11 Oct 77, 39
Contract EY-76-C-02-0016

Descriptors: *Developing countries, *Energy management, *Energy models, Data acquisition, Government policies, International cooperation, Planning, Social impact, Sociology, Urban areas.

Identifiers: ERDA/290000, ERDA/290100, ERDA/290200.

The unique characteristics of the energy situation in developing countries imposes a unique set of requirements on analytical techniques used for energy planning. The urgency of the situation requires the rapid development and use of simplified models which make maximum use of available data but which can reflect the international energy context. Those techniques must also be able to deal with central energy/development issues such as energy equity or the energy implication of social equity policies, centralized vs. decentralized development, and urbanization. (ERA citation 03:024139)

BNL-50633 PC A07/MF A01
Brookhaven National Lab., Upton, N.Y.
Planner's Energy Workbook: A Manual for Exploring Relationships Between Land Use and Energy Utilization
T. O. Carroll, R. Nathans, P. F. Palmedo, and R. Stern. Jun 77, 129
Contract EY-76-C-02-0016

Descriptors: *Energy analysis, conservation, *Energy supplies, *Land use, *Rural areas, *Urban areas, Communities, Charges, Correlations, Demand factors, Energy consumption, Energy policy, Government policies, Manuals, Planning, Regional analysis, Social impact.

Identifiers: ERDA/290000, ERDA/290300, ERDA/290100, ERDA/510500, ERDA/320100, *Regional planning.

It has been clear that the magnitude and character of a region's energy requirements are intimately related to the spatial configuration and mix of land use activities. To the degree to which they can shape the future configurations of residential, commercial, industrial, and transportation activities, local governments and their planners must give serious consideration to the energy implications of those configurations in the light of future social goals and requirements. This Planner's Energy Workbook describes a set of procedures that can be used to carry out community and regional energy analyses. The choice of land use activity parameters and their relation to energy use characteristics are associated with the normal planning concepts of land use density, type of residential development, commercial floorspace, industrial sales and employment, and shopping and work trip lengths. At the same time these energy related intensity coefficients are expressed in a form that permits the analysis of short-term conservation strategies such as the retrofit of insulation and the introduction of new technologies such as solar energy. An integrating framework is provided to construct total community or area energy consumption profiles and future needs; to examine compatibility between area requirements and the energy supply-distribution system serving the area; and to evaluate the implications for energy use of the physical configuration of urban, suburban and rural areas. Two cases illustrate the application of

SELECTED APPROPRIATE TECHNOLOGIES

this Workbook. The Long Island area is representative of major suburban regions throughout the U.S. which have undergone major growth and development. A community redevelopment design in Tucson, Arizona is typical of rapid and major land use development within the environs of an existing city. (ERA citation 03:010551)

COM-71-00049 PC A11 MF A01
Bureau of Commercial Fisheries, Ann Arbor, Mich.
A Program of Research for the Catfish Farming Industry.
Sep 70, 233p* EDACOMM-70-015

Descriptors: *Fisheries, Economic development, *Catfishes, *Aquaculture, Surveys, Methodology, Feeding stuffs, Harvesting, Processing, Marketing, Food services, Ponds, Lakes, Equipment, Statistical data, Profits.
Identifiers: *Fish farms.

The study reports on the history and current state of the industry, improvement of harvesting methods and equipment, and present and future markets including pay-lakes and restaurants. Research results are reported as regards catfish processing and feedstuffs and diets for catfish. (EDA ABSTRACT)

COM-71-00111 PC A20 MF A01
Checchi and Co., Washington, D.C.
The Role of Cooperatives in the Production and Marketing of Fruits and Vegetables in Puerto Rico.
Final rept.
Aug 70, 474p EDA-70-020
Grant EDA-02-6-09134

Descriptors: *Marketing, Cooperation, *Farm processing, Economic development, *Economic development, *Puerto Rico, *Agricultural products, Marketing, Fruits, Vegetables, Financial management, Management engineering, Local government, Policies, Market research, Economic factors.
Identifiers: Technical assistance projects, *Agricultural cooperatives, *Cooperatives, Cooperative production and marketing systems.

The report concludes that a new fruit and vegetable growing and marketing cooperative should be established as the basic element in an approach to self-sufficiency in fruit and vegetable production for Puerto Rico. The study says adequate financing and management and enthusiastic support from the Commonwealth government can produce an agricultural cooperative that will contribute significantly to community economy. Types of produce have been examined in terms of production and marketing. Organization of cooperatives is also discussed. (EDA abstract)

COM-71-00202 Reprint
National Marine Fisheries Service, Seattle, Wash.
Biological Lab.
Growth in Experimental Populations of Tilapia mossambica
Ralph P. Silliman. 24 Jun 70, 3p NOAA-71011206
Pub. in BioScience, v20 n20 p1109-1110, 15 Oct 70.

Descriptors: *Fishes, Growth, *Fresh water fishes, Growth, Fresh water biology, Growth curves, Gompertz curves, Aquatic biology, Food consumption, Population(Statistics).
Identifiers: *Tilapia mossambica.

Two populations of Tilapia mossambica were raised in tanks and their growth (weight and length) recorded for a period of 36 months. The relationship between number and weight is graphed, but was drastically disturbed by accidental mortalities at month 21.1. It never regained regularity after the accident; prior to that it had been regular. (Author)

COM-71-00655 PC A02 MF A01
National Marine Fisheries Service, Miami, Fla.
Tropical Atlantic Biological Lab.

Commercial Fishery and Biology of the Fresh-Water Shrimp, 'Macrobrachium', in the Lower St. Paul River, Liberia, 1952-53
Special scientific rept.
George C. Miller. Feb 71, 17p Fisheries-626, Contrib-141, NOAA-71032318

Descriptors: *Shrimps, Fisheries, *Fisheries, *Liberia, Freshwater biology, Estuaries, Seasonal variations, Marine biology, Shellfish, Fecundity.
Identifiers: Macrobrachium.

A small fishery was conducted for the large commercial fresh-water shrimp, Macrobrachium vollenhovenii, using traps. A second smaller species, M. macrobrachion, was culled from the trap catch for the fishermen's use. The estuarine fishery was seasonal (May to January), during the period of low salinity. Cost of raw tail meats to the consumer was over \$1.00 (U.S.) per pound. The fishermen derived more than \$7,500 from the fishery. Commercial shrimp, M. vollenhovenii, spawned in the estuary from May to January. Fecundity was estimated at 12,000 to 45,000 eggs per female. As the embryo developed the color of the egg changed from red to brown. Embryonic and larval development to time of setting of M. vollenhovenii was believed similar to that of M. rosenbergii 50 to 65 days. An intensive push-net fishery was conducted on the zero age group soon after the juveniles had set. Juvenile shrimp were not caught by traps.

COM-71-00716 PC A17 MF A01
Black and Veatch, Kansas City, Mo.
Preliminary Study of the Development of Water Resources of the Humacao Sub-Region Puerto Rico
May 71, 388p EDA-71-060
Prepared in cooperation with Domenech (R. A.) and Associates, Hato Rey, Puerto Rico.

Descriptors: *Water supply, Surveys, *Economic development, Puerto Rico, *Puerto Rico, *Water resources, Requirements, Recommendations, Surface water runoff, Groundwater, Demography, Econometrics, Water storage, Classifications, Soil erosion, Waste water, Flood control, Government policies.
Identifiers: *Humacao(Puerto Rico).

The report appraises present and future water needs and analyzes potential yield from sources of water supply. Surface water and ground water control problems are identified. Alternative recommendations are made on how to provide water for the area's change over from an agricultural to an industrial economy. These include use of ground water as an economical water source and surface water through reservoirs, wastewater reclamation, and long distance imports. Sea water as a source is reported as uneconomical. Other recommendations: floodways and levees rather than storage reservoirs for flood control. Wastewater disposal in the ocean with disposal in streams to be phased out. Data to be coordinated for guidance in design of water development projects, and strict regulation to be provided to avoid waste resulting from increasing competition for water supplies. Detailed maps and figures are included.

COM-71-00717 PC A04 MF A01
Indian Development District of Arizona, Inc., Phoenix.
Arizona Indian Business Development Program
Final rept.
Robert J. Slinkard. 1971, 67p EDA-71-057
Contract EDA-9-35142

Descriptors: *Ethnic groups, American Indian languages, *Economic development, Projects, *Commerce, *Arizona, Rural areas, Economic surveys, Regional planning, Community development, Industrial training, Counseling, Manuals.
Identifiers: *Minority owned enterprises, *American Indians, Indian reservations, Technical assistance.

The report reviews 133 projects processed in efforts to further the growth of business on Indian reservations by Indian entrepreneurs. An untried approach, the promotion of Indians in business in relatively remote areas where business facilities

have never been before and where a business atmosphere did not exist. An improvised training manual to suit such areas is reproduced in the report as are various forms used in carrying out the project. In addition to counseling, the project provided technical assistance services, refinancing, promotion of community support for new businesses, management, production, and training, and legal needs. (EDA abstract)

COM-71-01017 PC A05 MF A01
National Marine Fisheries Service, Gloucester, Mass. Fishery Products Technology Lab.
A Study to Develop New Products from Whiting or Other Underutilized Species
Feasibility study Nov 68-Oct 70
M. L. Anderson, and J. M. Mendelsohn. Aug 71, 79p EDA-71-090

Descriptors: *Fishes, *Food processing, Economic development, Abundance, Unemployment, Freeze drying, Market research, Cost estimates, Feasibility.
Identifiers: Whiting, Salt curing, Fishcakes.

The study describes development of a rapid salt-curing process for whiting and similar species that are underutilized when they are most seasonally abundant. The process requires fish fillets to be ground in saturated brine with salt added to keep the brine saturated during salting. It can be completed in less than a day. Reports indicate the product is a good ingredient for fishcakes and can be used to make convenience-type heat-and-serve foods. Limited marketing studies indicate good commercial potential for these products when a meat-bone separator is further developed. The report says whiting and related products must be produced on a semi-commercial scale before costs can be assessed, but that estimates indicate they can be competitive with other products now on the market. (Author)

COM-71-50005-62 PC-SOD/MF A01-NTIS
Bureau of International Commerce, Washington, D.C.
Establishing a Business in Turkey
Overseas Business Reports
Peter B. Hale. Nov 70, 20p Rept no. OBR-70-62
Supersedes OBR-67-77, COM-70-00854. Paper copy available from SOD \$16.00/year, \$0.15/copy as C1.50:70-62.

Descriptors: *Economic development, *Turkey, *Investments, Handbooks, Capital, Government policies, Treaties, Legislation, Organizations, Patents, Copyrights, Employment, Taxes, Fees, Public utilities, Labor relations.
Identifiers: Overseas business reports, Business organizations, Capital repatriation, Trademarks.

Basic, authoritative information is presented for exporters, importers, investors, manufacturers, researchers, and those concerned with international trade and economic conditions. (BIC abstract)

COM-71-50005-92 PC-SOD/MF A01-NTIS
Bureau of International Commerce, Washington, D.C.
Establishing a Business in the Dominican Republic. 13p
Overseas Business Reports
Robert H. Bateman. Dec 70, 13p Rept no. OBR-70-92
Paper copy available from SOD \$16.00/year, \$0.15/copy as C1.50:70-92.

Descriptors: *Economic development, *Dominican Republic, *Investments, Handbooks, Capital, Government policies, Industries, Sugar crops, Legislation, Land titles, Mining, Organizations, Patents, Employment, Taxes, Copyrights.
Identifiers: Overseas business reports, Business organizations, Sugar industry, Capital repatriation.

Basic, authoritative information is presented for exporters, importers, investors, manufacturers, researchers, and those concerned with international trade and economic conditions. (BIC abstract)

SELECTED APPROPRIATE TECHNOLOGIES

COM-71-50584

PC A02/MF A01
Rhode Island Univ., Kingston, International Center for Marine Resource Development.

The Potential for Fishery Development In the Caribbean and Adjacent Seas

Clarence P. Idyll. 1971, 17p Marine Bull-1,
NOAA-71102004

Presented at Rhode Island Univ. on Mar 16, 1971, at a seminar on issues of International Economic Development.

Descriptors: *Fisheries, Economic development, *Caribbean Sea, Fisheries, Developing countries, Food supply, Economic factors, Fishing, Seafood, Financing, Marketing, Manpower, Government policies.

The Caribbean Region is examined for its potential to produce greater supplies of food from the sea. The Caribbean people are relatively large consumers of fish and spend an important part of their scarce foreign exchange to buy fish from other nations. In considering the potential of fish and seafood from these enormous water areas it would appear that importing large supplies of seafood would be unnecessary. Factors to consider in fishery development in this area include the political, social and economic aspects, since these determine whether whatever fish is available can be transported, marketed and purchased by the people of this area. (Author)

COM-72-10054

PC A03/MF A01
Colorado Cooperative Fishery Univ, Fort Collins.

Pond Culture of Bait Fishes

Stephen A. Flickinger. 1 Apr 71, 43p NOAA-72011322

Grant NMFS-6-2-D

Also pub. as Colorado Univ., Fort Collins. Cooperative Extension Service Bull-478A.

Descriptors: *Aquaculture, *Minnows, *Economic surveys, Aquaculture, Marketing, Ponds, Construction, Fresh water biology, Fishing, Feeding(Supplying), Diseases, Reproduction(Biology), Parasites.
Identifiers: Bait fishes, *Pond culture.

Major considerations in the culture of the golden shiner and fathead minnow as bait fish are presented. Emphasis is upon economic considerations, pond construction, propagation techniques, feeding and harvesting. (Author)

COM-72-10588

PC A06/MF A01
Bureau of Sport Fisheries and Wildlife, Stuttgart, Ark. Warmwater Fish Cultural Labs.

Factors Affecting the Growth and Production of Channel Catfish In Raceways

Jun 72, 108p EDA-72-036

Descriptors: *Fishes, *Aquaculture, Economic development, Nutrition, Growth, Waste treatment, Organic wastes.

Identifiers: *Catfish, Ictalurus catus.

The study shows that fish can be reared successfully in tanks, but that production costs under the present system would eliminate all profit. Data are presented to indicate that further studies would be useful. It is stated that recycling of effluent waters can reduce levels of metabolic wastes sufficiently to support fish growth. The report includes evaluations of filters and of an oxidation pool to remove wastes, stocking density and diet studies, and reports on examinations of plasma proteins, tissue composition, and the liver of channel catfish.

COM-72-11539

PC A04/MF A01
Gibbs and Hill, Inc., New York.

Feasibility Study of Waste Water Recovery In Shrimp Processing Plants

Nov 72, 63p EDA-72-058

Descriptors: *Shrimps, Food processing, *Waste water, Recovery, Economic development, Employment, Regional planning, Feasibility, Water reclamation, Massachusetts, Fishing, Food industry, Cost analysis.

Identifiers: Gloucester(Massachusetts).

The shrimp industry is capable of revitalizing the economy in Gloucester, Massachusetts, where fishing and fish processing employment has been waning. The study examines the need to provide waste water recovery facilities and peeling machinery modifications, so that the shrimp industry can develop new processing plants at Gloucester. Cost and technical processing data is included in the study, together with a schematic diagram indicating suggested facilities and modifications. (Author)

COM-72-50175-017

PC-GPO/MF A01-NTIS/copy
Bureau of International Commerce, Washington, D.C.

Establishing a Business In the Philippines

John D. Phipps. May 72, 20p Rept no. OBR-72-017

Paper copy available from GPO \$16.00/year as C1.50:72, \$0.15/copy.

Descriptors: *Economic development, *Philippines, *Investments, Handbooks, Legislation.
Identifiers: Business organizations.

The reports present basic authoritative information for exporters, importers, investors, manufacturers, researchers, and those concerned with international trade and economic conditions. For individual reports, see below:

COM-72-50175-018

PC-GPO/MF A01-NTIS
Bureau of International Commerce, Washington, D.C.

Establishing a Business In Hong Kong

Arthur R. Dornheim. Jun 72, 28p Rept no. OBR-72-018

Paper copy available from GPO \$16.00/year as C1.50:72, \$0.15/copy.

Descriptors: *Economic development, *Hong Kong, *Investments, Handbooks, Economic conditions.
Identifiers: Overseas Business Reports, *Business organizations.

The reports present basic authoritative information for exporters, importers, investors, manufacturers, researchers, and those concerned with international trade and economic conditions. For individual reports, see below:

COM-72-50175-027

PC-GPO/MF A01-NTIS
Bureau of International Commerce, Washington, D.C.

Establishing a Business In Mexico

Paul S. Flores. Jul 72, 28p Rept no. OBR-72-027

Paper copy available from GPO \$16.00/year as C1.50:72, \$0.15/copy.

Descriptors: *Economic development, *Mexico, *Investments, Handbooks, Economic conditions.
Identifiers: Overseas Business Reports, *Business organizations.

The reports present basic authoritative information for exporters, importers, investors, manufacturers, researchers, and those concerned with international trade and economic conditions. For individual reports, see below:

COM-72-50175-033

PC-GPO/MF A01-NTIS
Bureau of International Commerce, Washington, D.C.

Establishing a Business In Kuwait

Kathleen M. Keim. Jul 72, 16p Rept no. OBR-72-033

Paper copy available from GPO \$16.00/year as C1.50:72, \$0.15/copy.

Descriptors: *Economic development, *Kuwait, *Investments, Handbooks.
Identifiers: Overseas Business Reports, Business organizations.

The reports present basic authoritative information for exporters, importers, investors, manufacturers,

researchers, and those concerned with international trade and economic conditions. For individual reports, see below:

COM-72-50175-038

PC-GPO/MF A01-NTIS

Bureau of International Commerce, Washington, D.C.

Establishing a Business In Thailand

John N. Randolph, Jr. Aug 72, 24 Rept no. OBR-72-038

Paper copy available from GPO \$16.00/year as C1.50:72, \$0.15/copy.

Descriptors: *Economic development, *Thailand, *Investments, Handbooks.
Identifiers: Overseas Business Reports, Business organizations.

The reports present basic authoritative information for exporters, importers, investors, manufacturers, researchers, and those concerned with international trade and economic conditions. For individual reports, see below:

COM-72-50251-03-12

(Order as COM-72-50251-03)

National Marine Fisheries Service, Seattle, Wash. Northwest Fisheries Center.

Effect of Crowding on Relation Between Exploitation and Yield In 'Tilapia macrocephala'

Ralph P. Silliman. Nov 71, 8p NOAA-72101809-12

Included in Fishery Bull., v70 n3 p693-698 Jul 72.

Descriptors: *Fishes, Population(Statistics), *Aquaculture, Population(Statistics), Growth, Environments, Marine fishes, Marine biology, Periodicals.

Identifiers: Tilapia macrocephala.

An experiment was performed to assess the effect of crowding on yield in Tilapia macrocephala. Populations of nearly equal number and weight were started in control (155.2 liter) and test (77.6 liter) tanks. Food amounts and environmental attributes other than space were the same for both tanks. Each of the two populations was exploited - first at a bimonthly rate of 10% for 14 months, then at a bimonthly rate of 25% for 10 months. Equilibrium yields at each rate for each tank (four points) were fitted with a Fox exponential surplus-yield model. Deviations from this general population curve showed that yields were greater for the larger tank at the 25% rate and greater for the smaller tank at the 10% rate. This is believed to result from the fact that the entire yield came from growth at the lower rate whereas part of the yield came from recruitment at the higher rate. A low rate of conversion of food to fish (18%) is believed to be due to the large proportion of liver in the diet. (Author)

COM-72-50659

PC-GPO/MF A01-NTIS

Economic Development Administration, Washington, D.C.

Urban Business Profile: Supermarkets

Apr 72, 34p Rept no. EDA-72-59597

Prepared in cooperation with Office of Minority Business Enterprise, Washington, D.C.

Paper copy available from GPO \$0.30 as C46.27:SU7.

Descriptors: *Marketing, Urban areas, *Commerce, Manuals, Risk, Feasibility, Organizing, Management, Leasing, Financing, Inventories, Competition.

Identifiers: Urban business profiles, *Minority enterprises, Technical assistance, Cooperatives, *Supermarkets.

The report is designed to provide a potential businessman with a better understanding of the opportunities, requirements, and problems associated with operating a supermarket, to provide guidelines on types of information required for location-specific feasibility studies; and to assist urban development groups in their business creation activities.

SELECTED APPROPRIATE TECHNOLOGIES

COM-73-10115-04

(Order as COM-73-10115)

Hawaii Univ., Honolulu.

Some Remarks on Aquaculture

John Bardach. 1971, 7p NOAA-72102701-4

Included in Proceedings: National Sea Grant Conference (4th), Oct 71, p83-88, COM-73-10115.

Descriptors: *Aquaculture, Economic development, Fishes, Economic factors, Feeding stuffs, Animal nutrition, Human nutrition.

Identifiers: Sea Grant program.

An appraisal of the influences on and constraints to the development of aquaculture should be approached through systems models where initial, crude modeling leads to the definition of specific research needs. As such research is undertaken, its results are fed back into more refined models, hopefully soon to answer the overall question: what is the true potential of aquaculture and how can it be attained. (Author)

COM-73-10152

PC A04/MF A01

Massachusetts Inst. of Tech., Cambridge. Sea Grant Project Office.

A Preliminary Feasibility Study of Irish Moss Harvesting Systems

James M. Patel. 30 Jun 72, 74p MITSG-72-14, NOAA-72121102

Contract NOAA-2-35150

Sponsored in part by Henry L. and Grace Doherty Charitable Foundation, Inc., Darien, Conn.

Descriptors: *Aquatic plants, Harvesting, Algae, Rhodophyta, Evaluation, Feasibility, Machinery, Massachusetts, New Hampshire, Economic development, Maine, Coasts.

Identifiers: Sea Grant program, Chondrus crispus, Gigartina stellata.

The feasibility of developing mechanized harvesting systems is discussed. Biological, economic, environmental, and legal constraints on the system design are delineated. The operation of two systems which have been constructed and tested is described. It is concluded that while the technology to construct the system exists, such a system would be economically unfeasible due to the low unit price of harvested Irish Moss. An improved manual harvester is also described. (Author)

COM-73-10275

PC A02/MF A01

Rhode Island Univ., Kingston. Marine Advisory Service.

Fisheries Cooperatives: Their Formation and Operation

James J. Napoli. Oct 72, 21p Marine M-30,

NOAA-73012403

Descriptors: *Fisheries, Production, *Marketing, Cooperation, Organizations, Law(Jurisprudence), Harvesting, Credit, Management, Banking business.

Identifiers: *Cooperatives.

The organization, development, function, and problems of producer cooperatives for fishermen are discussed. An appendix covers the Farm Credit System: its organization, authority, and eligibility requirements to borrow. (Author)

COM-73-10343

PC A03/MF A01

Lake States Forestry Cooperative, Inc., Duluth, Minn.

Forestry Cooperative Demonstration Program

Interim rept. Feb 70-Nov 72.

Mar 73, 47p EDA-73-020

Descriptors: *Economic development, Forestry, *Forestry, Great Lakes Region, Management planning, Land use, Marketing, Rural areas, Forest land, Employment, Organizations.

Identifiers: Technical assistance, Cooperatives.

The report describes a forestry cooperative demonstration project funded by EDA and the Upper Great Lakes Regional Commission to evaluate potential for forestry cooperatives in the Great Lake States. A 6-months feasibility study shows need for an organization to work with private woodland

owners on management practices. Also described is a business development program, which assisted existing businesses, helped create new business, and provided management and marketing assistance. The potential for a statewide landowners' association is explored. A section of the report is devoted to implications for rural development activities, with emphasis on cooperatives. (Author)

COM-73-10355

PC A02/MF A01

Utah State Board for Vocational Education, Salt Lake City.

Plute Vocational Education Project—Plute County School District

Final rept.

Oct 72, 20p FCRC-TA-411-112-035

Descriptors: *Education, *Farms, *Vocational guidance, *New Mexico, Economic development, Projects, Specialized training, Community development, Surveys, Livestock, Water supply, Dairies, Poultry, Swine, Land development, Mining.

Identifiers: *Plute County(New Mexico), Tourism.

A report is made on planning and implementation of farm program curricula and demonstration projects.

COM-73-10527

PC A03/MF A01

New Mexico Univ., Albuquerque. Center of Environmental Research and Development.

A Study of the Feasibility of Mechanized Adobe Production

Aug 70, 49p FCRC-TA-301-500-013

Descriptors: *Bricks, Mass production, *Houses, *Brick construction, Brick structures, Structural clay products, Brick industry, Materials handling, Production methods, Feasibility, Cost analysis, Building codes.

Identifiers: *Adobe, Adobe construction, FCRC.

The general purpose of this study is to determine the economic feasibility of the Centro de Adobes concept, considered an Economic Opportunity Development for the poor. The project designers see the creation of from 15 to 30 new jobs per manufacturing center. It is also necessary to predict the subsidiary job creation as well as to estimate what this may mean in terms of dollar turnover in the total economy of a typical village (and in general terms, of the state). (Author)

COM-73-10791

PC E01/MF A01

Oregon State Univ., Corvallis. Sea Grant Marine Advisory Program.

Organizing and Operating a Fishery Cooperative. Part II

Frederick J. Smith. 1973, 45 OSU-SG-19a,

NOAA-73050202

See also Part 1, COM-73-10790.

Descriptors: *Fisheries, Organizations, Law(Jurisprudence), Management, Industries, Marketing, Regulations.

Identifiers: Sea Grant program, NOAA.

The publication provides information about cooperative organization, management, and legal instruments used in organizing and operating a cooperative. It is available in two parts. The first part provides an overview of cooperative organization and operation. This portion, part two, provides greater detail about the legal instruments and requirements of a fishery cooperative.

COM-73-10795

PC A05/MF A01

Puerto Rico Dept. of Agriculture, Mayaguez. Lab. of Commercial Fisheries.

A Study of the Feasibility of Establishing a Distant-Water Fishing Industry in Puerto Rico

Feasibility study.

May 73, 79p EDA-73-032

Contract C-0-35464

Descriptors: *Fisheries, Feasibility, *Economic development, *Puerto Rico, Aquaculture, Employment, Unemployment, Financing, Bibliographies, Regional planning.

Identifiers: Technical assistance, EDA.

The report reviews possibilities for a distant-water fishing industry in Puerto Rico and concludes that fishing, processing, and shore support can all be developed for profit but not without risk. It is suggested that a Puerto Rican fleet could harvest a substantial amount of fish in the Caribbean and the tropical Atlantic. Alternatives of how best to do this are presented. The report also reviews potential for developing Puerto Rican-based processing facilities and shore support services. A bibliography is appended.

COM-73-10810

PC A02/MF A01

Illinois State Natural History Survey, Urbana. Aquatic Biology Section.

Combined Culture of Channel Catfish and Golden Shiners in Wading Pools

D. Homer Buck, Richard J. Baur, Charles F. III Thoits, and C. Russell Rose. Apr 72, 13p Biological Notes-79, NOAA-73050404

Grant NMFS-4-36-R

Descriptors: *Fishes, *Aquaculture, Catfishes, Carp, Minnows, Shiners, Mixing, Growth, Ecology.

Identifiers: Ictalurus punctatus, Notemigonus crysoleucas, Tilapia mossambica, Cyprinus carpio, Tilapia aurea, Animal behavior, NOAA.

The study was undertaken to obtain information on the behavior, comparative efficiencies, and degrees of compatibility of channel catfish and golden shiners when in different combinations and under different spatial limitations. It was found that growth increments of carp (Cyprinus carpio) and tilapia (Tilapia aurea) in mixed culture sometimes exceeded those exhibited by either in monoculture. The authors found that the channel catfish, golden shiner and tilapia (*T. mossambica*) were extremely compatible. When combined, each stimulated the other to a faster and stronger feeding response, which resulted in a more efficient conversion of food.

COM-73-11257/5

PC A09/MF A01

Washington Univ., Seattle. Div. of Marine Resources.

The Land Water Interface in an Urban Region: A Spatial and Temporal Analysis of the Nature and Significances of Conflicts Between Coastal Uses

Doctoral thesis

Peter Harrison. 1973, 196p* WSG-TH-73-1, NOAA-73061206

Descriptors: *Coasts, *Economic analysis, *Land use, Economic analysis, *Regional planning, Coasts, Puget Sound, Washington(State), Urban areas, Economic development, Theses.

Identifiers: Coastal zone management, Sea Grant program, NOAA.

This dissertation presents a framework for empirical analysis of the changing use of the coastline in an urban region. The first objective was to describe and analyze the growth of coastal activities. The second objective was to analyze the role of common property resources in the generation of negative externalities, and in the conflict situations which arise between coastal activities. The third objective was to test the relevance and utility of the concepts and classifications developed. The Puget Sound area was used as the locus of the study. In the final portion of the study consideration was given to the impact on the political structure of the region, and the effect upon the spatial distribution of activities around the coastline.

COM-73-50276

PC-GPO/MF A01-NTIS

National Marine Fisheries Service, Seattle, Wash. A Review of the Literature on the Development of Skipjack Tuna Fisheries in the Central and Western Pacific Ocean

Technical rept.

Frank J. Hester, and Tamio Otsu. Jan 73, 20p

NOAA-TR-NMFS-SSRF-661, NOAA-7030518

Paper copy available from GPO \$0.25 as C55.13.NMFS-SSRF-661.

Descriptors: *Tunas, Fisheries, *Fisheries, *Pacific Ocean, Reviews, Management, Abundance, Economic development, Assessments.

SELECTED APPROPRIATE TECHNOLOGIES

Identifiers: Katsuwonus pelamis, Bait fish, *Skipjack tuna, Central Pacific Ocean, Western Pacific Ocean, NOAA.

There has been a rapid acceleration in efforts to develop skipjack tuna fisheries in the central and western Pacific. This is because the resources of the larger tunas (yellowfin, bigeye, bluefin, and albacore) are already being fished at or near the maximum sustainable level. The greatest potential for increased harvest appears to be the skipjack resource. To assist the skipjack development effort, pertinent information on the subject is summarized and a bibliography of selected references is included. (Author)

COM-73-50645-11-2

(Order as COM-73-50645-11)

National Marine Fisheries Service, Seattle, Wash. Pacific Fishery Products Technology Center.

The Technological Basis for Development of Aquaculture to Produce Low-Cost Food Fish

J. A. Dassow, and M. A. Steinberg. 1973, 9p

MFR-Paper-1015, NOAA-73112804-2

Included in Marine Fisheries Review, v35 n11 p6-13 Nov 73, COM-73-50645-11.

Descriptors: *Fishes, *Aquaculture, Food processing, Quality, Cost factors, Frozen foods, Proteins, Inland waterways, Food additives.

Identifiers: NOAA.

The technological basis for development of large-scale production of inland water fish, such as carp, buffalo fish, tilapia, and white amur, is reviewed. It is proposed that modern methods of mass production and fish culture be evaluated and combined to make the production of low-cost food fish feasible and economically attractive. The fish would be processed for maximum recovery of edible flesh by mechanical methods of flesh separation. The minced flesh would be modified and stabilized as required to prepare high-quality frozen fish blocks. These blocks would be suitable for a wide variety of frozen fishery products and convenience foods and could be used as protein additives in other foods such as processed meats. (Modified author abstract)

COM-74-10059/5

Reprint

National Marine Fisheries Service, Seattle, Wash. Northwest Fisheries Center.

Examples of National Contributions to the Development and Management of the Oceans' Living Resources

Dayton L. Alverson. 1973, 20p NOAA-73121206

Pub. in Proceedings of Annual Conference Marine Technology Society (9th), p191-208 1973.

Descriptors: *Fisheries, *Pacific Ocean, Resources, Seafood, Management, Economic development, Marine fishes, Lipids.

Identifiers: Anadromous fishes, NOAA.

During this post-war era, the science of fisheries population dynamics grew to maturity through the establishment of workable quantitative theory. The era was also extremely productive in terms of scientific planning documents related to national ocean policy. A focal study of national investigations conducted in the northeastern Pacific suggests that such investigations have been instrumental in stimulating growth of the ocean food fish industry and provided information upon which major national and international management decisions have been made. In addition, such studies have yielded information of value in maintenance of a productive aquatic environment.

COM-74-10543/8

PC E02/MF A01

Wisconsin Univ., Madison. Center of Applied Sociology.

Problems and Challenges Faced by Rural Communities with Industrial Development

John T. Scott, Jr. and Gene F. Summers. 1972, 25p EDA/OER-74-182

Grant EDA-OER-417-G-72-7

Prepared in cooperation with Illinois Univ., Urbana. Presented at North Central Regional Conference on Problems and Potentials of Rural Industrialization at Purdue, Univ., Lafayette, Ind., 11-13 Jul 72.

Descriptors: *Rural areas, *Industrialization, *Problem solving, *Economic development, Community relations, Economic impact, Illinois, Manufacturing, Industrial plants, Industrial development, Social effect, Labor force, Economic changes, Land use, Cost of living.

Identifiers: Challenges, EDA.

The paper reviews a few typical problem areas which may arise in a rural community during and following industrialization. Data from a longitudinal (1966-1971) study of the construction of a large manufacturing facility in north central Illinois is used. Included in the discussion are such factors as the social and economic effects of the labor force employed by the industry, changes in the use of land and local facilities, and potential increases in the cost of living.

COM-74-10547/9

PC A02/MF A01

Wisconsin Univ., Madison. Center of Applied Sociology.

Profile Change When Industry Moves into a Rural Area

Working paper

John T. Scott, Jr., Gene F. Summers, and John P. Clark. Feb 73, 15p* EDA/OER-74-103

Grant EDA-OER-417-G-72-7

Prepared in cooperation with Illinois Univ., Urbana. Dept. of Sociology.

Descriptors: *Rural areas, *Industrialization, *Economic impact, *Economic development, Economic analysis, Economic characteristics, Resources, Social effect, Industrial plants, Illinois, Community relations, Manufacturing industries, Land use, Services, Manpower utilization, Retail sales, Housing characteristics.

Identifiers: EDA.

The paper examines what happens to the economic and social profile of a rural community when industry is introduced. The profile delineates the type, amount, and ratio of existing resources and products of the community. Data from a longitudinal (1966-1971) study of the construction of a large manufacturing facility in north central Illinois is employed. The evidence suggests that the most profound impact is on the land use and support systems. Additional changes are realized in the size and composition of the labor force, retail sales and services, housing development, and the demand for schools and other publicly provided services.

COM-74-11005/7

PC A05/MF A01

Marine Technology Society, Washington, D.C. Committee on Economic Potential of the Ocean.

Assessing Technology for Marine Resource Development. Proceedings of a Conference-Workshop Held by the Marine Technology Society at Arlington, Virginia on May 15-17, 1972

Milton G. Johnson. Mar 74, 97p* NOAA-74032701

Descriptors: *Marine engineering, *Ocean environments, *Meetings, Forecasting, Economic development, Oceanography, Investments, Government policies, Management planning.

Identifiers: Technology assessment.

Contents:

Technology assessment:

Its purpose, method, and scope;

The past, present and future of technology assessment;

Technology forecasting:

How good it is;

Technology assessment of marine resources development;

Assessment of technologies for the protection and enhancement of the marine environment;

Requirements of the Congress for Technology Assessment;

Planning a balanced university program of oceanographic education and research;

Criteria for corporate investment in ocean research and development;

Our changing ocean priorities;

The role of Congress in marine research and resource development;

The role of the Office of Science and Technology; Oceanography - a budgetary controllable whose time may not come; Technology: Reassessment and reassurance.

COM-74-11195/6

PC E01/MF A01

Kentucky Research Foundation, Lexington.

Commercial Banking in Growth Regions

Research rept.

L. Randolph McGee. Aug 70, 28 Discussion

Paper-34, EDA/OER-74-249

Grant EDA-OER-227-G-68-11

Descriptors: *Commercial banking, *Regional economy, *Economic development, *Policies, Reviews, Regional development, Growth rate, Developing countries, Economic needs, Factor analysis, Economic structure, Banking practices.

A focus is made on the issues of the banking role in the process of regional economic growth. The discussion is limited to rapidly growing regions in a developed national economy. The role of banking in regions of underdeveloped nations may be quite different from the role outlined in this paper, but some of the growth factors discussed herein would be relevant. After discussing national versus regional banking and banking functions in a growth region, the author notes that it would be presumptuous to suggest specific guidelines for measuring banking performance in growth regions, since regions grow in differing ways and specific demands for financial services vary.

COM-74-11487/7

PC E03/MF A01

Smithsonian Institution, Washington, D.C. Center for the Study of Man.

Alternative Economic Development Policies for Indian Communities. Executive Summary

Research rept.

Sam Stanley. Jul 74, 57p EDA/OER-74-324

Grant EDA-OER-400-G-71-18

See also COM-74-11488.

Paper copy also available in set of 8 reports as COM-74-11486-SET, \$69.00.

Descriptors: *Economic development, *American Indians, *Communities, Policies, Organizations, Leadership, Employment, Income, Natural resources, Commercial practices, Minerals, Fisheries, Woodworking, Handicrafts, Sociology.

Identifiers: Cherokee Indians, Sioux Indians, Lummi Indians, Morongo Indians, Passamaquoddy Indians, Papago Indians.

The summary of an eight-volume study presents the point of view of the concept of 'economic development' and of efforts to improve conditions in Indian reservations and communities, as well as to pinpoint factors detracting from the success of such efforts. A number of Indians have participated in the seven studies of individual tribes which form the basis for a comparative analysis. The tribes selected for the study are Lummi, Morongo, Navajo, Papago, Eastern Oklahoma Cherokee, Passamaquoddy, Pine Ridge Oglala Sioux.

COM-74-11489/3

PC E07/MF A01

Smithsonian Institution, Washington, D.C. Center for the Study of Man.

Alternative Economic Development Policies for Indian Communities. Making Do with the Dark Meat: A Report on the Cherokee Indians in Oklahoma

Research rept.

Albert L. Wahrhaftig. Jul 74, 179p EDA/OER-74-

324-2

Grant EDA-OER-400-G-71-18

See also COM-74-11490.

Paper copy also available in set of 8 reports as COM-74-11486-SET, PC E99.

Descriptors: *Economic development, *American Indians, *Communities, Policies, Organizations, Leadership, Employment, Income, Natural resources, Commercial practices, Minerals, Fisheries, Woodworking, Handicrafts, Sociology.

SELECTED APPROPRIATE TECHNOLOGIES

Contents: How the Cherokee got that way; How Cherokee settlements survive; The Cherokee establishment.

COM-74-11490/1 PC E06/MF A01
Smithsonian Institution, Washington, D.C. Center for the Study of Man.

Alternative Economic Development Policies for Indian Communities. The Lummi Indian Community: The Fishermen of the Pacific Northwest

Research rept.

Vine Deloria, Jr. Jul 74, 127p EDA/OER-74-324-3
Grant EDA-OER-400-G-71-18

See also COM-74-11491.

Paper copy also available in set of 8 reports as COM-74-11486-SET, \$69.00.

Descriptors: *Economic development, *American Indians, *Communities, Policies, Organizations, Leadership, Employment, Income, Natural resources, Commercial practices, Minerals, Fisheries, Woodworking, Handicrafts, Sociology.

Contents: The period of white settlement; Early reservation days (1855-1890); The years of poverty (1890-1964); Political development; The Lummi aquaculture project; The Lummi concept; The Lummi experience and other Indian tribes; and Values and goals of the reservation.

COM-74-11491/9 PC E06/MF A01
Smithsonian Institution, Washington, D.C. Center for the Study of Man.

Alternative Economic Development Policies for Indian Communities. Morongo Indian Reservation: A Century of Adaptive Strategies

Research rept.

Lowell John Bean. Jul 74, 141p EDA/OER-74-324-4
Grant EDA-OER-400-G-71-18

See also COM-74-11492.

Paper copy also available in set of 8 reports as COM-74-11486-SET, \$69.00.

Descriptors: *Economic development, *American Indians, *Communities, Policies, Organizations, Leadership, Employment, Income, Natural resources, Commercial practices, Minerals, Fisheries, Woodworking, Handicrafts, Sociology.

Contents: Tribal background; Leadership develops new strategies; Seven viable expressive-instrumental associations; Morongo and the Mission Indian subculture; Ethnic identity at Morongo; Economic development and political affairs.

COM-74-11492/7 PC E05/MF A01
Smithsonian Institution, Washington, D.C. Center for the Study of Man.

Alternative Economic Development Policies for Indian Communities. Dressing for the Window: Papago Indians and Economic Development

Research rept.

Henry F. Manuel, Julian Ramon, and Bernard L. Fontana. Jul 74, 109p EDA/OER-74-324-5
Grant EDA-OER-400-G-71-18

See also COM-74-11493.

Paper copy also available in set of 8 reports as COM-74-11486-SET, \$69.00.

Descriptors: *Economic development, *American Indians, *Communities, Policies, Organizations, Leadership, Employment, Income, Natural resources, Commercial practices, Minerals, Fisheries, Woodworking, Handicrafts, Sociology.

Contents: The Papago reservation; Subsistence in Pimeria Alta; The new economy; Ruling elite; Case studies.

COM-74-11493/5 PC E06/MF A01
Smithsonian Institution, Washington, D.C. Center for the Study of Man.

Alternative Economic Development Policies for Indian Communities. Pine Ridge Economy: Cultural and Historical Perspectives

Research rept.

Raymond J. DeMallie. Jul 74, 130p EDA/OER-74-324-6
Grant EDA-OER-400-G-71-18
See also COM-74-11494.
Paper copy also available in set of 8 reports as COM-74-11486-SET, \$69.00.

Descriptors: *Economic development, *American Indians, *Communities, Policies, Organizations, Leadership, Employment, Income, Natural resources, Commercial practices, Minerals, Fisheries, Woodworking, Handicrafts, Sociology.

Contents: Cultural background; Historical background; Pine Ridge reservation today; Planned economic development.

COM-74-11494/3 PC E07/MF A01
Smithsonian Institution, Washington, D.C. Center for the Study of Man.

Alternative Economic Development Policies for Indian Communities. Passamaquoddy Economic Development In Cultural and Historical Perspective

Research rept.
Susan MacCulloch Stevens. Jul 74, 173p EDA/OER-74-324-7
Grant EDA-OER-400-G-71-18
See also COM-74-11486.
Paper copy also available in set of 8 reports as COM-74-11486-SET, \$69.00.

Descriptors: *Economic development, *American Indians, *Communities, Policies, Organizations, Leadership, Employment, Income, Natural resources, Commercial practices, Minerals, Fisheries, Woodworking, Handicrafts, Sociology.

Contents: Cultural and historical setting; Social institutions; Overall organization of the community; Relationships to the outside world; History of the Passamaquoddy; Factors affecting economic development; Products, services and markets; Psychosocial factors affecting work patterns and economic development; Implementation of federal social programs.

COM-74-11645/0 PC A03/MF A01
National Bureau of Standards, Washington, D.C. Center for Building Technology.

FY 1973 Progress Report on Design Criteria and Methodology for Construction of Low-Rise Buildings to Better Resist Typhoons and Hurricanes

Final rept.
N. J. Raufaste, and R. D. Marshall. 2 Jul 73, 32p
Rept no. NBSIR-74-582
Grant PASA-TA(CE)-04-73

Descriptors: *Houses, *Wind(Meteorology), *Design criteria, Construction, Construction materials, Typhoons, Hurricanes, Wind tunnel models, Developing countries.

This report highlights the major accomplishments of the initial phase of a three fiscal year project to provide engineering technical assistance to the Agency for International Development (AID) for the development of design criteria for low-cost/low-rise buildings to better withstand the effects of extreme winds. This phase represents approximately a 3 month level of effort. During this period CBT project staff members commenced six introductory tasks. These tasks will set the pace for the second fiscal year level of effort. The tasks included: initiate dialogue with local organizations and institutes in developing countries, establish a local Philippine advisory committee; conduct on-site visits to developing countries to identify local professional candidates for short term consulting; conduct on-site visits to developed countries to collect information from research centers; purchase initial wind tunnel and full-scale field test instrumentation; and commence library search of related subject documents.

COM-74-11781/3 PC A02
Rhode Island Univ., Kingston. Dept. of Sociology and Anthropology.

A Fisherman's Co-operative: Open System Theory Applied
Carl Gersuny, and John J. Poggie, Jr. 1974, 11p
Marine Reprint-25, NOAA-74102402
Grant NOAA-04-3-158-3
Pub. in Marit. Stud. Mgmt., v1 p215-222 1974.

Descriptors: *Fish marketing, *Commercial fishing, *Cooperative enterprises, Prices, Costs, Fishing equipment, New England.
Identifiers: Reprints, Sea Grant program.

There are about eighty co-operative associations in the commercial fisheries of the United States. Of these, the Point Judith Fishermen's Co-operative Association is one of the most successful. Fishermen are motivated to band together in such organizations by the payment of low prices by fish dealers, by high individual costs in getting fish to the market, by the inordinate expense of money and time in obtaining equipment on a retail, individual basis, and by an unsatisfactory supply of producer services beneficial to fishing. As a case study to illustrate and analyse the functioning of co-operative within the framework of Thompson's open system theory the Point Judith Fishermen's Co-operative Association is described.

COM-74-50182/6 PC-GPO/MF A01-NTIS
National Bureau of Standards, Washington, D.C.
Some References on Metric Information with Charts on All You Need to Know About Metric; Metric Conversion Factors

Special pub.
W. Small. Dec 73, 13p Rept no. NBS-SP-389
Paper copy available from GPO \$0.25 as C13.10:389.

Descriptors: *Metric system, Conversion, Tables(Data).
Identifiers: NBS.

As metric use increases in this country, interest in metric information is also increasing. This booklet was developed to provide a listing of sources for pertinent metric information. Included is a list of publications produced by the National Bureau of Standards and available from the Superintendent of Documents. Also included is a list assembled by the National Council of Teachers of Mathematics of organizations that market metric materials for educators, and a list of additional sources of metric information.

COM-74-50184/2 PC-GPO/MF A01-NTIS
National Bureau of Standards, Washington, D.C. Center for Building Technology.

Design, Siting, and Construction of Low-Cost Housing and Community Buildings to Better Withstand Earthquakes and Windstorms

Final rept.
William F. Reps, and Emil Simiu. Jan 74, 153p
Rept no. NBS-BSS-48
Sponsored in part by Agency for International Development, Washington, D.C.
Paper copy available from GPO \$4.85 as C13.29/2:48.

Descriptors: *Buildings, *Environmental engineering, *Storms, *Earthquakes, Turkey, Peru, Philippine Islands, Developing countries, Earthquake resistant structures, Avalanches, Site surveys, Structural engineering, Disasters.
Identifiers: *Low cost housing, *Windstorms, NBS.

The report provides technical information regarding characteristics of materials and building systems, and discusses the structural performance of buildings subjected to the action of earthquakes and wind forces with specific reference to structures typical of developing countries. Potential ways are described in which structures can be made more resistant to such action. Siting considerations are discussed from a geological, seismic and climatological viewpoint, and recommendations relating to siting problems are made. Techniques of housing construction, both traditional and industrialized, are described and improvements resulting in better earthquake or windstorm resistance are suggested. Building codes, their improvement and their enforcement are also discussed.

SELECTED APPROPRIATE TECHNOLOGIES

COM-74-50189-01-05

(Order as COM-74-50189-01)
 United Nations Development Program, Manila
 (Philippines).
A Review of the Indonesian Shrimp Fishery and Its Present Developments
 Foreign fisheries leaflet
 M. Unar. 1974, 11p NMFS-FFL-73-16, MFR-
 Paper-1030
 Included in Marine Fisheries Review, v36 n1 p21-
 30 Jan 74, COM-74-50189-01.

Descriptors: *Shrimp fisheries, *Indonesia, Food supply, Food storage, Economic development, Fishing grounds, Fishing industry, Reviews.
 Identifiers: NOAA.

In 1968 joint ventures involving foreign capital were established in shrimp fisheries in several parts of Indonesia, particularly in the Sumatra, Kalimantan, and West Irian regions. This has given rise to the establishment of new small shrimp centers such as those in Kotabaru, on the island of Pulau Laut in southeast Kalimantan, Ambon and Sorong.

COM-74-50522/3

PC-GPO/MF A01-NTIS
 Economic Development Administration, Washington, D.C.
The Potential of Handcrafts as a Viable Economic Force - An Overview
 May 74, 56p
 Paper copy available from GPO \$0.65.

Descriptors: *Crafts, *Marketing, Craftsmen, Skills, Financing, Designers, Economic factors, Operating costs, Blighted areas.
 Identifiers: *Handicrafts, Design crafts.

Handcrafts are considered to be an emerging and viable economic force, but their impact must be viewed relative to their setting. They often may generate jobs and income in areas that offer only meager alternatives. Handcrafts preserve our national folk heritage, contribute to our cultural traditions, and provide both recreational and therapeutic benefits to handicapped persons, the elderly, and others. Crafts can be produced, individually, by sophisticated urban-oriented artisans and by isolated mountaineers; by urban or rural cooperatives; by such ethnic groups as Indians, Mexican-Americans, and Alaskan Natives; and by craft centers, where volume production is combined with hand skills. There is growing market for quality crafts that can be supplied in quantity and dependably.

COM-74-51230/2

PC-GPO/MF A01-NTIS
 National Bureau of Standards, Washington, D.C.
 Center for Building Technology.
FY 74 Progress Report on Design Criteria and Methodology for Construction of Low-Rise Buildings to Resist Typhoons and Hurricanes
 Interim rept. 1 Jul 73-30 Jun 74 (Final)
 Noel J. Raufaste, Jr. and Richard D. Marshall. Jul 74, 277p Rept no. NBSIR-74-567
 Grant PASA-TA(CE)-04-73
 Paper copy available from GPO.

Descriptors: *Residential buildings, *Environmental engineering, *Wind pressure, Typhoons, Hurricanes, Developing countries, Technical assistance, Design criteria, Technology transfer, Wind tunnel models, Meetings, Test facilities, Workshops, Loads(Forces), Gust loads.
 Identifiers: Low rise buildings, Wind resistant buildings.

This report gives the major accomplishments of the second phase of a three year project to develop improved design criteria for low-rise buildings that better resist extreme winds. During FY 74, the Center for Building Technology commenced several tasks which will serve as major inputs to the development of improved design criteria. These tasks include: (1) selecting two more field test sites in the Philippines, (2) instrumenting four full scale houses, (3) instrumenting the University of Philippines wind tunnel facility, (4) participating in a 1973 International workshop at Manila, and (5) helping develop in Bangladesh and Jamaica a methodology for the transfer of technology.

COM-75-10241/8

PC A02
 State Univ. of New York, Stony Brook. Marine Sciences Research Center.
Inexpensive Modular Habitats for Juvenile Lobsters ('Homarus americanus')
 Matoira H. Chanley, and Orville W. Terry. 14 Mar 74, 5p NOAA-74123102
 Grant NOAA-2-35281
 Pub. in Aquaculture, v4 p89-92 1974. Prepared in cooperation with Suffolk County Community Coll., Selden, N.Y.

Descriptors: *Lobsters, *Aquaculture, Shellfish, Larvae, Design, Diagrams.
 Identifiers: Reprints, Homarus americanus, Habitats.

The paper presents details of a device which is suitable for use as a rearing habitat for juvenile lobsters (genus Homarus) from the fourth stage to a size with a carapace length of about 2.7 cm. The device is thought to be original and an improvement over others previously reported.

COM-75-10263/2

PC A02
 Puerto Rico Univ., Mayaguez. Dept. of Marine Sciences.
Opercular Algal Growth on the Cichlid Fish 'Tilapia aurea', Cultured In Sea Water
 James W. Miller, and David L. Ballantine. 1974, 5p NOAA-75021303
 Pub. in Aquaculture, v4 p93-95 1974.

Descriptors: *Aquaculture, *Animal diseases, *Fishes, Vibrio, Bacterial diseases, Infectious diseases, Algae, Sea water, Chlorophyta, Aeromonas, Phaeophyta.
 Identifiers: Reprints, Tilapia aurea.

Enteromorpha lingulata (Chlorophyta) and Giffordia mitchellae (Phaeophyta) were found growing on opercula of Tilapia aurea cultured in sea water. Fish observed had mild Vibrio and Aeromonas bacterial infections, manifested by abscesses on their opercula and other areas of the body. Algal growth was observed only on the operculum, which appears to be a more suitable attachment site due to its bony nature. Abscessed areas on opercula were devoid of scales. Mechanical abrasion resulting in scale loss appears to provide a suitable attachment site for algae. Plants examined were small, up to six mm in length. Tufts of algae covered opercular abscesses. Fish did not appear to be attracted to tufts of algae growing on other fish; all fish appeared normal in behavior, exhibiting a positive response to feeding and satisfactory growth.

COM-75-10394/5

PC A08/MF A01
 Puerto Rico Univ., Mayaguez. Dept. of Marine Sciences.
The Development of Cultures of the Channel Catfish 'Ictalurus punctatus' and 'Tilapia' Species In Puerto Rico

Final rept. 1 Jul 71-30 Jun 74
 Francisco A. Pagan-Font. 30 Jun 74, 174p
 NOAA-75022110

Descriptors: *Catfishes, *Aquaculture, Fishes, Fisheries, Puerto Rico, Cultures(Biology), Recommendations, Salinity, Temperature, Feeding stuffs.
 Identifiers: Channel catfish, Ictalurus punctatus, Tilapia aurea.

Polyculture of channel catfish with Tilapia spp. was demonstrated. Recommended harvest size for catfish is 350 g obtainable in one year. T. aurea can produce three crops per year at a weight of over 68.1 g per fish. Sugar mill waste, rum and beer distillery wastes, tuna stickwater, pharmaceutical yeasts, and chicken manure were found to be of possible use as local fish feeds. Raceway cultures were found to be expensive and are not recommended at this time. In polyculture trials it was found that 9000 kg per hectare per year may be attained. The Lajas Valley appears to be most suitable for fish culture where some 700 acres, which is too saline for agricultural purposes, could be used.

COM-75-10474/5

PC A19/MF A01
 Massachusetts Inst. of Tech., Cambridge. Sea Grant Project Office.
Using Co-operatives to Aid the New England Fishing Industry
 Henry S. Marcus, James R. Townley, Jr, Alan J. Brown, and Eddie Lee. 31 Dec 74, 437p MITSG-75-7, NOAA-75031703
 Grant NOAA-04-5-158-1
 Index No. 75-307-Nel.

Descriptors: *Fisheries, *Accounting, *Financial management, Fish industry, Marketing, Food processing, Personnel management, Economic analysis, Seafood, Prices, Systems analysis, Sea urchins, New England.
 Identifiers: *Cooperatives, Sea Grant program.

The four-part study provides insight into the New England fishing industry in order to determine how fishing co-operatives can be more effective. The thrust of the research was to put into perspective the role of fishing co-operatives, their problems, and their future. The concept, background, financial management, personnel management, marketing problems, processing procedures, market competition, and systems management of New England co-operatives is addressed. Specific studies deal with an analysis of accounting systems for fisheries; future prospects for New England domestic and imported fish processing and handling facilities; and a systems management approach to analyzing distant markets for New England seafood, with particular emphasis on the exportation of fresh sea urchin roe.

COM-75-11378/7

PC A04/MF A01
 National Marine Fisheries Service, Gloucester, Mass. Atlantic Fishery Products Technology Center.

A Study: Expanded Processing Techniques, Production Costs and Market Survey of Under-utilized Fish Species
 Technical assistance rept.
 J. M. Mendelsohn. May 74, 60p* EDA-75-05
 Grant EDA-01-6-09131-2

Descriptors: *Fishes, *Economic development, *Market research, Abundance, Food processing, Food consumption, Food preparation, Food storage, Drying, Feasibility, Acceptability.
 Identifiers: *Merluccius bilinearis, *Market surveys, Fish products, Technical assistance, *Fish cakes.

The program was carried out by the Atlantic Fishery Products Technology Center (AFPTC), National Marine Fisheries Service (NMFS) under a one-year contract with the Economic Development Administration (EDA), U.S. Department of Commerce. The contract called for implementing the results of a previous study (A Study to Develop New Products from Whiting or Other Underutilized Species), in which new products having commercial potential were prepared on a laboratory scale from seasonally abundant and underutilized whiting (Merluccius bilinearis) and similar species.

COM-75-50001/7

PC-GPO/MF A01-NTIS
 National Bureau of Standards, Washington, D.C.
 Center for Building Technology.

Development of Improved Design Criteria for Low-Rise Buildings in Developing Countries to Better Resist the Effects of Extreme Winds. Proceedings of a Workshop Held at the Dr. Paulino J. Garcia Memorial Hall, National Science Development Board, Manila, Philippines, November 14-17, 1973
 Building science series rept.
 Noel J. Raufaste, Jr. and Richard D. Marshall. Oct 74, 169p* Rept no. NBS-BSS-56
 Grant PASA-TA(CE)-04-73
 Library of Congress Catalog Card no. 74-600158. Paper copy available from GPO as C13.29/2:56.

Descriptors: *Buildings, *Wind pressure, *Storms, *Developing countries, Meetings, Design criteria, Dynamic structural analysis, Hurricanes, Damage control, Management information systems, Recommendations.

Identifiers: *Wind resistant buildings, *Low rise buildings.

SELECTED APPROPRIATE TECHNOLOGIES

A 1973 international workshop held in Manila, Philippines, addressed the state-of-the-art in mitigating building damages from winds. The workshop was jointly sponsored by the United States Agency for International Development (USAID), a Philippine advisory committee, and the U.S. National Bureau of Standards (NBS). This report presents the proceedings derived from the workshop. The proceedings present recommendations, the workshop program, five reports, and nine technical articles. The technical articles addressed four primary topics which were used to guide subsequent workshop discussions. The topics addressed were; wind and aerodynamics, structural related technology, socio-economic and architectural considerations, and codes and standards. The results of the workshop suggest improved building practices for developing countries and the development of improved design criteria for low-rise buildings to better resist the effects of extreme winds.

COM-75-50185-03-05

(Order as COM-75-50185-03)

Texas A and M Univ., College Station. Dept. of Marketing.

An Analysis of Prices Paid to Fishermen Before and After the Establishment of a Fishery Cooperative

Charles W. Lamb, Jr. Mar 75, 4p MFR-Paper-1130

Grant NOAA-2-35364

Included in Marine Fisheries Review, v37 n3 p36-38 Mar 75.

Descriptors: *Fish industry, *Cooperatives, Objectives, Fish harvesting, Prices, Fish economics, Food storage, Food processing, Exports, Marketing.

Identifiers: Sea Grant program.

'A fishery cooperative consists of a group of individual fishermen acting together for mutual benefit and is designed to accomplish group objectives.' These group objectives are primarily economic in nature and often directly related to the prices paid to the fishermen for their catch. Common motivations to create fishery cooperatives include excessive price fluctuations, weakness of prices at the primary producer level, and/or insufficient storage and processing facilities. The paper reports the findings of a case study which compared the prices received by fishermen prior to and after the establishment of a unique fishery cooperative organization.

COM-75-50192-03-04

(Order as COM-75-50192-03)

National Marine Fisheries Service, Seattle, Wash. Northwest Fisheries Center.

Selective and Unselective Exploitation of Experimental Populations of 'Tilapia mossambica'

Ralph P. Silliman. Dec 74, 14p NOAA-75090808-4

Included in Fishery Bull., v73 n3 p495-507 Jul 75.

Descriptors: *Fishes, *Aquaculture, Growth, Mortality, Food habits, Breeding, Weight(Mass), Comparison, Selection, Economic factors, Mathematical models, Genetics.

Identifiers: *Tilapia mossambica, Fish stocks.

Two populations of Tilapia Mossambica were grown under controlled conditions. After a period of growth and stabilization at about 10 kg and 200 fish, exploitation was started; about 50 fish of outside stock were added to each population to increase genetic variability. Recruitment was estimated from data of stock, mortality, and catch. Parabolas fitted to the stock-recruitment relation suggested greater recruitment in the selectively fished stock than in the unselectively fished one. The exploitation-yield relation was assessed by fitting Fox surplus-yield models to both populations.

CONF-730560-1

PC A02/MF A01

Sydney Univ. (Australia).

Alternative Energy Sources: A Research Challenge

D. W. George. 1973, 21p
U.S. Sales Only.

Descriptors: *Energy sources, *Australia, *Tidal power, *Research programs, *Wind, Research programs, *Geothermal energy, Research programs, Economics, Energy consumption, Energy conversion, Energy source conservation, Environment, Fossil fuels, Fuel cells, Hydroelectric power, Magnetohydrodynamics, Natural gas, Solar energy.

Identifiers: AEC.

For abstract, see NSA 28 11, number 29382.

CONF-750712-12

PC A02/MF A01

Commonwealth Scientific and Industrial Research Organization, Melbourne (Australia).

Solar Energy for the Australian Food Processing Industry

D. Proctor, and R. N. Morse. 1975, 13p

Annual meeting of the International Solar Energy Society, Los Angeles, California, USA, 28 Jul 1975. U.S. Sales Only.

Descriptors: *Solar dryers, *Solar drying, Agriculture, Economics, Feasibility studies, Process heat, Temperature dependence.

Identifiers: ERDA/140905, ERDA/299001, Australia, *Food industry, Industries, Cost effectiveness.

Since the cost effectiveness of solar heat-generating systems decreases as the temperature increases, the potential for large-scale use of solar energy for industrial processes is very dependent on the operating temperature of the process. Examination of a sample of the Australian food-processing industry has shown that 70 percent of the heat is used at temperatures below 100 exp 0 C and there is no significant usage above 150 exp 0 C. A feasibility study of a typical plant in Melbourne shows that it is technically practicable to phase solar energy heating systems into existing processes, and that, using known techniques, over 50 percent of the annual heat requirements could be provided by solar collectors. The roof area is adequate for the mounting of collectors but space must be found for insulated hot-water tanks to provide thermal storage. Since the gross return on investment in the solar installation is the value of the fuel saved, this is directly related to fuel prices. In a situation where energy prices are changing rapidly, recommendations on cost effectiveness have no lasting significance. The paper describes simple methods of making accurate predictions for specific situations so that plant owners and operators can make their own judgements on cost effectiveness. (ERA citation 01:018935)

CONF-750761-1

PC A02/MF A01

Commonwealth Scientific and Industrial Research Organization, East Melbourne (Australia).

Application of Solar Energy in the Food Processing Industry

D. Proctor, and R. F. White. 1975, 9p

Meeting on applications of solar energy research and development in Australia, Melbourne, Australia, 2 Jul 1975. U.S. Sales Only.

Descriptors: *Solar collectors, *Solar drying, Process heat, Agriculture, Food, Economics, Industry.

Identifiers: ERDA/140905, ERDA/299001, Australia, *Food industry, Industries.

In the food processing industries investigated in this study, the major portion of the heat requirements were in processes operated with temperatures in the 60 to 80 exp 0 C range. Most of the process energy was required at constant temperature. An example of a factor is given to illustrate how solar energy can be integrated with conventional fuel so that the solar input is about 58 percent of the annual energy usage. It shows that currently available commercial collectors can operate with a positive return on investment within the life of the plant for process temperatures below 50 exp 0 C, but it also highlights the need for an improved commercial collector capable of producing high-temperature water. (ERA citation 01:018936)

CONF-760536-1

PC A02/MF A01

Oak Ridge National Lab., Tenn.

Potential for Energy Conservation Technology Transfer

E. C. Hise. 1976, 11p

Southern interstate nuclear board meeting, Winston-Salem, North Carolina, United States of America (USA), 24 May 1976.

Descriptors: *Commercial buildings, *Energy conservation, *Energy consumption, *Houses, Technology transfer, Air conditioning, Capital, Economics, Efficiency, Engineering, Environmental effects, Furnaces, Government policies, Heat pumps, Modifications, Sociology, Space heating, Standards, Thermal insulation, Water heaters.

Identifiers: ERDA/291000, ERDA/320100, *Residential buildings, Hot water heating.

The segment of energy consumption related to space conditioning and water heating in residential, commercial, and institutional buildings is discussed specifically. Within this constraint building energy consumption is discussed, considering three choices: drastic alteration of life style; even greater energy operating costs; or relatively large capital expenditures to reduce building energy consumption. It is concluded that the average existing residence can, through insulation, reduce its energy consumption to 60 percent of present for an expenditure of \$500 to \$1000 and a pay back of 5 to 10 years. The average existing commercial or institutional building can save even more, although their construction may require less commonplace insulation methods than residences. New construction can show greater energy savings at little or no additional construction cost. From data contained in reports in the bibliography (10 items), the author again concludes that the average existing residential heating/cooling system (equipment) can be modified or replaced to reduce its energy consumption to 60 percent or even 40 percent of the present at a cost of a few hundred to \$3000 as a function of the problem. The possible savings in commercial and institutional buildings are equally great. (ERA citation 01:019507)

CONF-770367-

PC A15/MF A01

Ohio Agricultural Research and Development Center, Wooster.

Proceedings of a Conference on Solar Energy for Heating Greenhouses and Greenhouse-Residential Combinations

T. E. Bond, L. C. Godbey, and H. F. Zornig. Nov 77, 350p

Conference on solar energy for greenhouses and greenhouse-residential combinations, Cleveland, OH, USA, 20 Mar 1977.

Descriptors: *Greenhouses, *Solar heating systems, *Meetings, Agriculture, Food industry, Leading abstract.

Identifiers: ERDA/140901, ERDA/299001, ERDA/553000.

Seventeen papers are included. A separate abstract was prepared for each for Energy Research Abstracts (ERA); eight are included in Energy Abstracts for Policy Analysis (EAPA). (ERA citation 03:030595)

COO-2390-15

PC A02/MF A01

Massachusetts Inst. of Tech., Cambridge. Dept. of Materials Science and Engineering.

Needs and Opportunities for Ceramic Science and Technology

W. D. Kingery. 1976, 12p Rept no. CONF-7605158-1

Contract EY-76-S-02-2390

International meeting on modern ceramic technology, Rimini, Italy, 26 May 1976.

Descriptors: *Ceramics, *Industrial plants, Capital, Demand factors, Energy consumption, Energy demand, Environmental effects, Manufacturing, Materials, Resources, Technology assessment.

Identifiers: ERDA/320302, ERDA/320302, Investments, Manpower, Energy requirements, Fabrication, Ceramics industry, Industries.

There clearly seems to be a consensus developing that technological requirements, including ceramics, will be sought in the next few decades with regard to (1) substituting common and readily available materials for rarer and therefore dimin-

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ishing resources, (2) making strong efforts to either conserve energy or develop new sources of energy, (3) protecting the environment, and (4) providing opportunities for more worker satisfaction. An attempt is made to relate these objectives to needs and opportunities for ceramics. The following considerations are discussed in reference to the ceramic industry: labor-capital requirements, materials resource requirements, energy requirements, environmental requirements, fabrication requirements, and new product requirements. (ERA citation 02:057032)

COO/2829-1 PC A06/MF A01

InterTechnology Corp., Warrenton, Va.

Analysis of the Economic Potential of Solar Thermal Energy to Provide Industrial Process Heat. Final Report, Volume I

7 Feb 77, 120p

Contract EY-76-C-02-2829

Descriptors: *Agriculture, *Industrial plants, *Process heat, *Solar collectors, *Solar cookers, *Solar drying, *Solar furnaces, *Solar kilns, *Solar stills, *Solar water heaters, Automobile industry, Boilers, Building materials, Chemical industry, Coal industry, Concentrating collectors, Cost, Economics, Environmental effects, Fertilizers, Financial incentives, Flat plate collectors, Food industry, Glass industry, Industry, Legal aspects, Life-cycle cost, Mathematical models, Meat industry, Metal industry, Mineral industry, Ore processing, Paper industry, Petroleum industry, Site selection, Solar cooking, Solar distillation, Solar drying, Synthetic fuels industry, Technology assessment.
Identifiers: ERDA/140905, ERDA/141000, ERDA/299001, ERDA/140300, ERDA/140909, Textile industry, Industries, Solar water heating.

The process heat data base assembled as the result of this survey includes specific process applications from 78 four-digit Standard Industrial Classification (SIC) groups. These applications account for the consumption of 9.81 quadrillion Btu in 1974, about 59 percent of the 16.6 quadrillion Btu estimated to have been used for all process heat in 1974. About 7 exp 1 / sub 2 percent of industrial process heat is used below 212 exp 0 F (100 exp 0 C), and 28 percent below 550 exp 0 F (288 exp 0 C). In this study, the quantitative assessment of the potential of solar thermal energy systems to provide industrial process heat indicates that solar energy has a maximum potential to provide 0.6 quadrillion Btu per year in 1985, and 7.3 quadrillion Btu per year in 2000, in economic competition with the projected costs of conventional fossil fuels for applications having a maximum required temperature of 550 exp 0 (288 exp 0 C). A wide variety of collector types were compared for performance and cost characteristics. Performance calculations were carried out for a baseline solar system providing hot water in representative cities in six geographical regions within the U.S. Specific industries that should have significant potential for solar process heat for a variety of reasons include food, textiles, chemicals, and primary metals. Lumber and wood products, and paper and allied products also appear to have significant potential. However, good potential applications for solar process heat can be found across the board throughout industry. Finally, an assessment of nontechnical issues that may influence the use of solar process heat in industry showed that the most important issues are the establishment of solar rights, standardization and certification for solar components and systems, and resolution of certain labor-related issues. (Volume 1 of 3 volumes.). (ERA citation 02:058733)

COO/2829-2 PC A99/MF A01

InterTechnology Corp., Warrenton, Va.

Analysis of the Economic Potential of Solar Thermal Energy to Provide Industrial Process Heat. Final Report, Volume II

7 Feb 77, 1234p

Contract EY-76-C-02-2829

Descriptors: *Industrial plants, *Process heat, *Solar air heaters, *Solar collectors, *Solar cookers, *Solar dryers, *Solar furnaces, *Solar kilns, *Solar stills, *Solar water heaters, Agriculture, Automobile industry, Boilers, Building materials, Chemical industry, Coal industry, Concentrating

collectors, Cost, Economics, Environmental effects, Fertilizers, Financial incentives, Flat plate collectors, Food industry, Glass industry, Industry, Legal aspects, Life-cycle cost, Mathematical models, Meat industry, Metal industry, Mineral industry, Ore processing, Paper industry, Petroleum industry, Site selection, Solar cooking, Solar distillation, Solar drying, Synthetic fuels industry.
Identifiers: ERDA/140905, ERDA/141000, ERDA/140300, ERDA/140909, ERDA/299001.

This report is Volume 2 of three volumes. For abstract see Volume I, report COO/2829-1. (ERA citation 02:058734)

COO/2829-3 PC A99/MF A01

InterTechnology Corp., Warrenton, Va.

Analysis of the Economic Potential of Solar Thermal Energy to Provide Industrial Process Heat. Final Report, Volume III

7 Feb 77, 819p

Contract EY-76-C-02-2829

Descriptors: *Industrial plants, *Process heat, *Solar air heaters, *Solar collectors, *Solar cookers, *Solar dryers, *Solar furnaces, *Solar kilns, *Solar stills, *Solar water heaters, Agriculture, Automobile industry, Boilers, Building materials, Chemical industry, Coal industry, Concentrating collectors, Cost, Economics, Environmental effects, Fertilizers, Financial incentives, Flat plate collectors, Food industry, Glass industry, Industry, Legal aspects, Life-cycle cost, Mathematical models, Meat industry, Metal industry, Mineral industry, Ore processing, Paper industry, Petroleum industry, Site selection, Solar cooking, Solar distillation, Solar drying, Synthetic fuels industry.
Identifiers: ERDA/140905, ERDA/141000, ERDA/140300, ERDA/140909, ERDA/299001.

This report is Volume 3 of three volumes. For abstract, see Volume I, report COO/2829-1. (ERA citation 02:058735)

COO/2929-6 PC A05/MF A01

Honeywell, Inc., Minneapolis, Minn. Energy Resources Center.

Low-Cost Solar Air Heater. Semi-Annual Progress Report, June 29, 1976–December 22, 1976

D. R. Rask, and L. J. Mueller. 22 Dec 77, 89p
Contract EY-76-C-02-2929

Descriptors: *Solar air heaters, Computer calculations, Cost, Design, Efficiency, Fabrication, Jets, Performance, Performance testing, Simulation, Spectrally selective surfaces.
Identifiers: ERDA/141000, *Solar collectors, Heat transfer.

The results to date on the development of a low-cost solar air heater are described. A unique jet-impingement concept is used as the absorber plate-to-air stream heat-transfer mechanism. The program objective is to design, fabricate, test and evaluate the jet-impingement concept collector. For comparison purposes, a baseline parallel-plate collector was analyzed, fabricated and tested. Values for the average jet-heat transfer coefficient are predicted and presented. A computer simulation using a nodal network collector model is used to predict collector performance. The predicted efficiency improvement of the jet-plate collector over that of the parallel-plate collector, at a fixed-flow rate of 1.47 kg/min-m²(4SCFM/ft² exp 2), is approximately 11 percent for a one-cover design and 9 percent for a two-cover design. If the existing selective absorber coating and etched cover glass technology of Honeywell is applied to the jet-plate collector, the resulting performance gain over the baseline parallel-plate collector is 21 percent at the intercept and 35 percent for a typical space heating application. The collector mechanical design effort involved a study of cost effective methods for assembly and material selection. A preliminary recommended design is presented. In summary, it has been recommended that aluminized steel sheet, pre-painted with an acrylic paint, be used for the box material. A semi-rigid fiber glass, 2.54-cm (1-inch) thick, with an aluminum facing is recommended for the insulation. A steel absorber plate and a pre-assembled nozzle plate or perforated plate is used for the jet plate. Two sheets of 0.318-cm (0.125 inch) tempered, low-

iron glass are recommended for the glazings. The baseline parallel plate test results are presented. Since jet-plate collector testing had just commenced at the time of this writing, we have no test results. (ERA citation 03:008225)

COO-4094-1

PC A05/MF A01

Massachusetts Inst. of Tech., Lexington, Lincoln Lab.

Photovoltaic Power In Less Developed Countries

D. V. Smith. 24 Mar 77, 92p
Contract EY-76-C-02-4094

Descriptors: *Developing countries, *Irrigation, *Photovoltaic power plants, *Solar cell arrays, *Solar water pumps, Communities, Demonstration programs, Diesel engines, Drinking water, Economics, Electric power, Feasibility studies, Lighting systems, Photovoltaic conversion, Pumps, Rural populations, Solar cells, Television.
Identifiers: ERDA/140501, ERDA/140600, ERDA/140300, ERDA/299001.

The potential of solar photovoltaic power in the third world (less developed countries) is analyzed. Application of irrigation systems powered by photovoltaics in Bangladesh, Chad, India, and Pakistan, plus an economic analysis of a photovoltaic-powered village in northern India indicate solar energy is competitive with the least-cost fossil-fuel alternatives. The most cost-effective method for specific geographical locations can be determined by field testing based on the case history data reported. (ERA citation 02:045245)

DIB-76-02-503

PC E06/MF A01

P. A. Management Consultants (Pte) Ltd., Singapore.

Survey of the Market for Sawmilling and Woodworking Equipment In Singapore

Foreign market survey rept.

18 Jul 75, 112p

Sponsored in part by Domestic and International Business Administration, Washington, D.C.

Descriptors: *Market surveys, *Woodworking machinery, *Sawmills, *Singapore, Molding machines, Planers, Drilling machines(Tools), Materials handling equipment, Exports, International trade, Market research, United States.
Identifiers: SIC 3423, SIC 3537, SIC 3567, SIC 3811, SIC 3546, SIC 3425, SIC 3535, SIC 9770.

There are important markets in Singapore for several of the product categories under reference e.g., woodworking items. However, the total sawmilling and woodworking industry is not buoyant and in fact, certain sectors (e.g. sawmilling) are quite stagnant. Growth trends for the foreseeable future would therefore not be significant. Currently, awareness of the U.S. range of products is poor. Most respondents had no prior experience with U.S. equipment. Several misconceptions were evident; for example, it was felt that: U.S. equipment is highly priced or even over-priced; U.S. equipment, because of its high level of sophistication, is often not relevant to local operating requirements. Sales potential for the immediate future is generally poor. Of the total range of items under review, respondents indicated that the items more likely to be purchased within the next two years would probably include portable sawmills, molders, planing machines, drilling machines, and materials handling equipment.

DIB-77-10-514

PC E06/MF A01

Chinca Credit Information Service Ltd., Taipei (Taiwan). Marketing Research Dept.

Plywood Processing and Woodworking Equipment Study In Taiwan R. O. C

Foreign market survey rept.

Jun 77, 70p Rept no. Job-770355

Descriptors: *Market surveys, *Woodworking machinery, *Plywood, *Taiwan, Exports, Market research, United States.
Identifiers: SIC 3553, SIC 9770, *Foreign trade.

The market research was undertaken to study the present and potential US share of the market in Taiwan for plywood processing and woodworking

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equipment; to examine growth trends in the Taiwan end-user industries over the next few years; to identify specific product categories that offer the most promising export potential for US companies; and to provide basic data which will assist US suppliers in determining current and potential sales and marketing opportunities. The trade promotional and marketing techniques were also reviewed.

DOCKET-50334-46 PC A02/MF A01
Duquesne Light Co., Pittsburgh, Pa.
Beaver Valley Power Station, Unit 1. Fire at Motor Control Center 1-E6
24 Oct 72, 8p

Descriptors: *Beaver valley power reactor/ unit 1.
For abstract, see NSA 27 03, number 07044.

DOE/NASA/1022-78/29 PC A02/MF A01
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
Photovoltaic Water Pumping Applications: Assessment of the Near-Term Market
L. Rosenblum, W. J. Bifano, L. R. Scudder, W. A. Poley, and J. P. Cusick. Mar 78, 25p Rept no. NASA-TM-79847
Contract EX-76-A-29-1022

Descriptors: *Photovoltaic power plants, *Solar water pumps, *Solar cell arrays, Commercialization, Developing countries, Evaluation, Market.
Identifiers: ERDA/140600, ERDA/299001, ERDA/140501, Marketing.

A preliminary assessment of the near-term market for photovoltaic water pumping applications is presented. One of the objectives of the Department of Energy's (DOE) National Photovoltaic Program is to stimulate the demand for photovoltaic power systems so that appropriate markets will be developed in the near-term to support the increasing photovoltaic production capacity also being developed by DOE. Water pumping applications represent such a potential market for photovoltaics. The price of energy for photovoltaic systems is compared to that of utility line extensions and diesel generators. The potential "domestic" demand is defined in the government, commercial/institutional, and public sectors. The foreign demand and sources of funding for water pumping systems in the developing countries are also discussed briefly. It is concluded that a near-term domestic market of at least 240 megawatts (peak) and a foreign market of about 6 gigawatts (peak) exists and that significant market penetrations should be possible beginning in the 1981-82 period. (ERA citation 03:032896)

DOE/NASA/1028-77/13 PC A03/MF A01
National Aeronautics and Space Administration, Cleveland, Ohio. Lewis Research Center.
Wind Turbine Generator Rotor Blade Concepts with Low Cost Potential
T. L. Sullivan, T. P. Cahill, D. G. Griffee, Jr, and H. W. Gewehr. Dec 77, 40p Rept nos. CONF-780502-1, NASA-TM-73835
Contract EX-76-A-29-1028
23. national SAMPE symposium, Anaheim, CA, USA, 2 May 1978.

Descriptors: *Turbine blades, *Wind turbines, Cost, Fabrication, Feasibility studies, Performance, Stresses.
Identifiers: ERDA/170602, *Rotor blades(Turbo machinery).

Four processes for producing blades are examined. Two use filament winding techniques and two involve filling a mold or form to produce all or part of a blade. The processes are described and a comparison is made of costs, material properties, designs and free vibration characteristics. Conclusions are made regarding the feasibility of each process to produce low cost, structurally adequate blades. (ERA citation 03:028112)

ED-060 874 Not available NTIS
World Health Organization, Djakarta (Indonesia). Regional Office for South-East Asia.

Assignment Report on Library Banks in Health Institution in Indonesia
Takeo Urata. 1971, 34p Rept no. Indonesia-0115/E

Available from ERIC Document Reproduction Service, Bethesda, Md. 20014 PC\$3.29, MF\$0.65.

Descriptors: *Medical libraries, *Foreign countries, *Library survey, *Information networks, *Library networks, Information needs, *National programs, Developing nations, *Library collections, Library services, *Librarians, Library technicians.
Identifiers: *Indonesia.

The medical library needs of Indonesia were surveyed and recommendations for improving the existing situation are made based on the results of the survey. The survey indicates that: (1) the library collections are out of date and inadequate, (2) there is a need for more and better trained medical librarians and library assistants; (3) there is no modern circulation system for charging out books, (4) generally there is no good coordinated library service between the medical schools and the teaching hospitals and (5) many of the institutions surveyed have no library facilities at all. It is recommended that a Library Development Committee be appointed under the Ministry of Health and that this committee start working out a Master Plan at once. It is further recommended that two library administrators be sent abroad to see: (1) how the modern medical library is organized and managed, (2) how the modern medical library is used for education, research and clinics and (3) how library technology is developing to meet the daily needs. It is highly recommended that the publication and library routine work be mechanized. (Author/NH)

ED-061 963 Not available NTIS
Institute of Teachers' Training and Educational Sciences, Bandung (Indonesia). Bureau of Library.

The Education and Training of Indonesian Librarians: Problems and Prospects
Soejono Trim. Jul 70, 18p

Available from ERIC Document Reproduction Service, Bethesda, Md. 20014 PC\$3.29, MF\$0.65.

Descriptors: *Librarians, *Training, *Library education, Conference reports, *Public libraries, *Foreign countries, *Library schools, Developing nations, *Library technicians, Training, *Libraries, Foreign countries.
Identifiers: *Indonesia.

The education and training of Indonesian librarians is presented in the context of the Indonesian society; specifically, the relation with the educational aspects and programs of the nation. Only after these aspects are understood can well-balanced educational programs for the training of librarians be set up. It is shown that while there are demands for trained library personnel and professional librarians to support and enhance the national educational programs, the librarians' training centers are inadequate to meet those demands. Steps which could be taken to help solve these problems are suggested. (Author/NH)

ED-070 505 Not available NTIS
Tanganyika Library Service (Tanzania).

A National Plan for the Development of Library Services
Ezekiel E. Kaungamno. Sep 72, 25p

Available from ERIC Document Reproduction Service, Bethesda, Md. 20014, PC\$3.29, MF\$0.65.

Descriptors: *Library services, *Developing Nations, *African culture, Foreign countries, *Library planning, Library services, *Books, Publishing industry, *Public libraries, Branch libraries, *Special libraries, School libraries, *Library cooperation, Library planning, *Librarians, Training, *Library technicians, Training.
Identifiers: Tanganyika, ERICL.

The five essential features of any good library plan are objectives, inputs, process, outputs, and evaluation. In developing countries, the following factors affect, and should be considered in the formulation of library plans: illiteracy, lack of educational facilities, no common language, insufficient funds, and geographical features and the population distribution. The library services of Tanganyika are dis-

cussed, with these features and factors in mind, under the following headings: urban, rural and postal library service; box (collections of books) exchange; school libraries; special library development; Library Services Board Committees (including staff and training, and committees for public, school, special and branch libraries); the Development Programme; cooperation and coordination; manpower planning; recruitment and training of librarians and library assistants; and, the problems of book production. (Other documents on libraries in Tanganyika are available as: ED-053 749, ED-054 829 and ED-054 831.) (SJ)

EIS-AA-72-5805-D PC E05
Agricultural Stabilization and Conservation Service, Washington, D.C.

Rural Environmental Assistance Program
Draft environmental impact statement.
5 Dec 72, 116p USDA-ASCS-ES(Adm)-73-1, ELR-5805

Descriptors: *Environmental surveys, *Conservation, *United States, Environmental surveys, *Puerto Rico, Environmental surveys, *Virgin Islands, Environmental surveys, Soil conservation, Water conservation, Forest land, Wildlife, Pollution, Abatement, Rural areas, Construction, Vegetation, Soil erosion.
Identifiers: *Environmental impact statements.

The report describes the Rural Environmental Assistance Program, the Federal Government shares with farmers and ranchers and the cost of carrying out approved soil, water, woodland, and wildlife conservation and pollution-abatement practices on their land. The program places emphasis on the carrying out of long-term, enduring conservation and pollution-abatement measures on farm and ranch lands in all States, Puerto Rico, and the Virgin Islands. The program will speed up and/or make possible the carrying out of needed conservation and environmental protection and enhancing measures in rural America. The impact on the environment will be beneficial and largely cumulative. The stimulus of this program sets in motion total direct investments in a wide variety of conservation and pollution-abatement practices, by close to a million farmers and ranchers a year, amounting to double the public contribution. Adverse environmental effects of major consequence would not be anticipated, if good management is carried out by program participants. Some minor adverse environmental impacts may occur during the construction of water storage facilities, terraces, diversions, pollution-abatement, and other such measures, and during the establishment of vegetative cover and tree plantings because of soil being open for a short period of time to potential erosion and noise from construction and tillage equipment. (Author)

EIS-AA-73-1451-F PC A02/MF A01
Water Resources Council, Washington, D.C.
Principles and Standards for Planning Water and Related Land Resources
Final environmental impact statement.
4 Sep 73, 14p ELR-73-1451
Supersedes report dated Jul 72, PB-205 224-D-S.

Descriptors: *Environmental impact statements, *Natural resources, *United States, Environmental impact statements, Water resources, Land development, Conservation, Regional planning, Standards, Criteria, Participative management, Economic development, Environmental engineering, Esthetics, Reviews.
Identifiers: EIS.

Principles and standards are established for planning the use of the water and land resources of the United States to achieve objectives, determined cooperatively, through the coordinated actions of the Federal, State, and local governments; private enterprise and organizations; and individuals.

ERDA-tr-288 PC A02/MF A01
Universidad de los Andes, Orinoco (Colombia).
Center for the Integral Development of "Las Gaviotas"
21p
Translation: source information not available.

SELECTED APPROPRIATE TECHNOLOGIES

Descriptors: *Dams, *Hydroelectric power plants, Colombia, Construction, Design, Hydraulics, Hydroelectric power, Pipelines, Pumps, Research programs, Rural areas, Solar energy, Solar water heaters, Technology utilization, Transport, Water, Wind turbines.
Identifiers: ERDA/130000, ERDA/140907, ERDA/170600, Translations.

The following research projects in Colombia, are described briefly: development and use of 0.5 to 1.0 kW hydraulic turbines for rural hydroelectric power generation; water pipeline construction; construction of small dams; water pump design; wind mill design; development of solar water heaters; testing of hydraulic rams; an earth-cement solar reflector; and design of a cassava shredder. (ERA citation 03:023340)

ERDA-77-472 PC A04/MF A01
Energy Research and Development Administration, Washington, D.C. Div. of Solar Energy.
Solar Program Assessment: Environmental Factors, Solar Agricultural and Industrial Process Heat
Mar 77, 56p

Descriptors: *Agriculture, *Industrial plants, *Process heat, *Environmental impacts, Air quality, Animal shelters, Construction, Environmental effects, Greenhouses, Land use, Noise, Safety, Solar air heaters, Solar collectors, Solar drying, Solar energy, Solid wastes, Steam generators, Thermal pollution, Water quality.
Identifiers: ERDA/140905, ERDA/140907, ERDA/140400, *Solar heating.

The major environmental issues associated with the further development of solar energy as a source of process heat in the industrial and agricultural sectors are presented and prioritized. Agricultural and industrial heating represents the specific application of a variety of Federally-funded solar technologies. To provide a background for this environmental analysis, the basic concepts and technologies of solar process heating are reviewed. The potential effects of these applications of solar energy on the full range of environmental concerns (e.g., air and water quality, biosystems, safety, social/institutional structures) are then discussed in terms of both their relative significance and possible solutions. Although the development of solar energy as a source of process heat will contribute to some environmental problems common to construction projects and energy-producing technologies (e.g., construction noise, thermal discharge to the air and water), only those impacts unique to the solar portion of the technology are discussed in depth. Finally, an environmental work plan is presented, listing research and development proposals and a National Environmental Policy Act (NEPA) document work plan which might help clarify and/or alleviate specific environmental and safety problems. (ERA citation 02:048094)

ERDA-77-79 PC A05/MF A01
Energy Research and Development Administration, Washington, D.C. Office of Planning, Analysis, and Evaluation.
Managing the Socio-Economic Impacts of Energy Development: A Guide for the Small Community
Sep 77, 82p
Contract EA-77-C-10-0037

Descriptors: *Communities, *Energy source development, *Socio-economic factors, Boom towns, Decision making, Economic growth, Economic impact, Economics, Employment, Environmental impacts, Evaluation, Government policies, Income, Information, Local government, Management, Planning, Public health, Recreational areas, Residential sector, Safety, Social impact, Solid wastes, State government, USA, Waste disposal, Water resources, Water treatment.
Identifiers: ERDA/290200, ERDA/290300, ERDA/510500, ERDA/530100, ERDA/530200, Guidelines, Handbooks.

A decision concerning large-scale energy development is usually a complex one requiring cooperation of all levels of government as well as the gen-

eral public and the private sector. The purpose of this handbook is to provide local officials with guidance regarding how they may assess, plan, and manage the socio-economic impacts of such development. Key areas of discussion in this report include: employment; personal income; housing; education; transportation; water supply; solid waste collection and disposal; waste water treatment; health care; recreation; and safety. It is unrealistic to expect the typical small community to develop capabilities to independently evaluate a highly technical development which to them is a one-time occurrence. Thus, local officials must be aware of resources which they may tap for information and assistance at other levels of government. This handbook advises local officials on how they should organize to most effectively participate in assessing, planning, and managing energy development and how to insure that information is collected and analyzed to reflect local priorities and future planning needs. (ERA citation 03:031111)

E77-10024 PC A02/MF A01
Instituto Geofisico del Peru, Lima.
Application of Remote Sensing Techniques for the Study and Evaluation of Natural Resources In Peru
Progress rept.
Jose C. Pomalaya. 1975, 3p NASA-CR-149127

Descriptors: Peru, Tropical regions, Pipelines, Rivers, Agriculture, Earth resources program, Phosphates, Mines(Excavations), Multispectral photography.

No abstract available.

E78-10132 PC A02/MF A01
Ministry of Tourism and Wildlife, Nairobi (Kenya).
The Kenya Rangeland Ecological Monitoring Unit. LANDSAT II Investigation Number 27990
Final rept.
W. E. Stevens. 15 Feb 78, 18p NASA-CR-157011

Descriptors: *Kenya, *Rangelands, Environmental monitoring, Ecology, Arid lands, Land use, Vegetation, Ground truth, Soil moisture, Earth Resources program, Spectral reflectance.

The author has identified the following significant results. Methodology for aerial surveys and ground truth studies was developed, tested, and revised several times to produce reasonably firm methods of procedure. Computer programs were adapted or developed to analyze, store, and recall data from the ground and air monitoring surveys.

HCP/M3879-0003 PC A03/MF A01
Resource Planning Associates, Inc., Washington, D.C.
Comprehensive Community Planning for Energy Management and Conservation: Developing and Applying a Coordinated Approach to Energy-Related Community Development. Executive Summary
Dec 77, 36p
Contract EX-77-C-10-3879

Descriptors: *Communities, *Energy source development, *North Dakota, Economic impact, Efficiency, Energy conservation, Energy consumption, Energy management, Environmental impacts, Europe, Financing, France, Human populations, Land use, National energy plan, Planning, Recovery, Rural areas, Social impact, Socio-economic factors, Waste heat.
Identifiers: ERDA/290200, ERDA/510500, ERDA/298000, ERDA/530100.

This executive summary highlights and condenses the report HCP/M-3879/1, Vol. 1, which analyzes the community-development process and formulates an organizational approach to resolving the institutional and financial issues arising from energy-related community development. (ERA citation 03:021682)

HCP/M3879-1(V.1) PC A07/MF A01
Resource Planning Associates, Inc., Washington, D.C.
Comprehensive Community Planning for Energy Management and Conservation: Developing and Applying a Coordinated Approach to Energy-Related Community Development. Volume I
14 Oct 77, 140p
Contract EX-76-C-10-3879

Descriptors: *Communities, *Energy source development, North Dakota, Economic impact, Energy conservation, Energy management, Environmental impacts, Europe, Financing, France, Human populations, Land use, National Energy Plan, Planning, Recovery, Rural areas, Social impact, Socio-economic factors, Waste heat.
Identifiers: ERDA/290200, ERDA/510500, ERDA/298000, ERDA/530100, Mercer County(North Dakota).

To achieve the objectives of ERDA's Community Systems Program, physical and institutional characteristics that determine a community's levels and patterns of energy use must be defined and methods of coordinating its energy systems established. In Chapter 1, Managing Rapid Growth to Achieve the Goals of Energy-Related Community Development, the goals are identified and the development activities and management functions constituting an effective approach to achieving them are defined. The characteristic problems of rapid growth are described and their causes traced. In Chapter 2, Identifying Elements of a Community-Development Approach Applicable to the Rapid-Growth Context, a number of domestic and European community-development approaches that might be applicable to managing rapid growth in the boomtown context are surveyed. Applicable elements of a number of U.S. mechanisms and of two French community-development approaches that can serve as the basis for formulating an organizational approach are identified. In Chapter 3, Formulating a General Community-Development Approach, the effectiveness of the approach, its adaptability to the boomtown context, and its capability for achieving the goals of energy-related development are demonstrated. In Chapter 4, Adapting the General Approach to Mercer County, North Dakota, the complex rapid-growth situation in Mercer County, North Dakota, is described. Chapter 5 is entitled, Defining the Limitations of the Mercer County Approach and the General Approach. The content of Volume I is supplemented and supported by a series of appendices, assembled in Volume II. (ERA citation 03:021681)

HIT-693(V.2)(App.) PC A17/MF A01
Hittman Associates, Inc., Columbia, Md.
Comprehensive Community Planning for Energy Management and Conservation. First Interim Report. Volume II. Appendices
Apr 77, 391p
Contract EC-77-C-10-0023

Descriptors: *Communities, *Energy analysis, *Energy conservation, *Energy management, Bibliographies, Engineering, Environmental impacts, Information retrieval, Land use, Planning, Reviews, Rural areas, Sociology, Systems analysis, Urban areas.
Identifiers: ERDA/291000, ERDA/290100, ERDA/320100, ERDA/510500, ERDA/530100, State of the art.

This research effort performs a thorough survey of the state-of-the-art in each of the fields related to the community planning project for energy management and conservation. Appendix A describes the results of that survey. In attempting a major, interdisciplinary research and development project such as this one, it is necessary to integrate theory and practice from several fields. These include land use planning, political science, public administration, urban development, mechanical engineering, systems analysis, and the atmospheric sciences. The survey of current knowledge that was performed resulted in three major outputs. The first is an extensive bibliography of printed materials which are related to this project. The bibliography is presented as Appendix B at the conclusion of this document. The second major product

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of this task is an extensive set of abstracts of those relevant materials reviewed; this set of abstracts forms Appendix C. The third output of the survey is a set of reports of personal contacts with individuals or organizations that were either already working in the field of community energy analysis or were working in related fields. All contacts made were documented and contact reports are included in Appendix D. Appendix E is a description of community decision-making processes. (ERA citation 03:018384)

HRP-0006853-6 PC A02/MF A01
Kaiser Aluminum and Chemical Corp., Oakland, Calif.

Health Policies and International Corporations

James P. Hughes. Nov 75, 15p

This paper was presented at the 1975 Annual Meeting of the American Public Health Association.

Descriptors: *Environmental health, Water pollution, Sanitation, Safety hazards, Residential buildings, Public health, Occupational safety and health, Housing, Health care, Foreign countries, Disease vectors, Demography, Communities.

The human health impact of development projects conducted in emerging countries by international corporations is discussed. It is felt that the impact of such a project should be considered from the point of view of people residing in an area, the project's future neighbors, and those newly attracted to the project site. The direct health impact of a development project is examined in relation to communicable disease control, housing and sanitary facilities, dietary change, and the increased risk of road accidents. Direct health impacts of a development project on workers are concerned with work accidents, exposure to chemical and physical hazards, exposure to local diseases, and new disease vectors. The introduction of a major new project into a developing area is likely to create significant demands for a variety of social services, including medical care for project personnel and their dependents and for people ordinarily attracted to a development site. In addition, public health measures such as monitoring the safety of water and food supplies, the enforcement of sanitary regulations, and the control of disease vectors must be considered. Planning for health care in a development project must encompass therapeutic, preventive, and environmental services. A list of references is provided.

HRP-0007411/2 Not available NTIS
Rhode Island Univ., Kingston. Dept. of Industrial Engineering.

Maintenance System for a Small Hospital

Charles F. James, Joseph Stanislao, and Sharad Wavde. 1970, 3p

Pub. in Hospitals, Jnl. of the American Hospital Association v44 n24 p70-71, 74 16 Dec 70.

Descriptors: State regions, Specifications, Rhode Island, Personnel management, Performance standards, Methodology, Medical equipment, Health resources, Health planning agencies, Health care technology, Health care facilities, Data processing, Data processing systems, Data collection, Data acquisition.

A system is described that includes both preventive and corrective maintenance for a small hospital, based on experience at the 142-bed Westerly Hospital in Rhode Island. Equally applicable to any small health care organization such as a nursing home, the system is based on a program of weekly inspection and maintenance. The following system elements are included: work order form and procedures for its utilization, full set of equipment data records, and weekly schedule for comprehensive preventive maintenance. Maintenance service needs are communicated by hospital staff to the maintenance department via the work order. Equipment data records contain the item and its description, name of manufacturer, initial installation cost, date when put in service, and equipment specifications. It is noted that the weekly schedule should remain flexible to enable the maintenance supervisor to use the skills of his employees to best advantage. A weekly maintenance schedule form which is coded to denote three categories of

maintenance (overhaul, clean, and functional check) can be of assistance to the supervisor in determining the number of man-hours needed for the week, in general and for specific pieces of equipment. The system can be further refined for the purpose of charge - back accounting by key-punching certain data from work orders, and this information can be computerized to provide total man-hours, total maintenance costs, and accumulated totals of man-hours for individual classification.

HRP-0010205/3 Not available NTIS
World Health Organization, Geneva (Switzerland).
Meeting Basic Health Needs In Developing Countries: Alternative Approaches
1975, 20p
Pub. in WHO Chronicle v29 n5 p168-187 1975.

Descriptors: *Health care services, *Health care delivery, Rural health services, Rural areas, Research, Health manpower, Foreign countries.

Case studies are presented of primary health care projects undertaken in underdeveloped countries to identify the key factors in the success of such systems and to observe the effect of these factors in political, economic, and administrative frameworks. It appears that in underdeveloped countries, malnutrition and parasitic and infectious disease (including vector-borne, gastroenteric, and respiratory disease) are the main factors affecting health. Promising health programs were studied by World Health Organization and UNICEF teams in Bangladesh, Cuba, India, Niger, Nigeria, Tanzania, and Venezuela. In addition, visits were made to China and Yugoslavia. In some countries, there are complete countrywide health systems with a network of health workers from village to factory. In other countries, few resources are available and villagers are trained in the rudiments of primary care, disease prevention, and health education. They function as care-providers at the village level under the supervision (sometimes by two-way radio) of regional health care providers. Sometimes traditional medicine (acupuncture and Ayurvedic physicians in China and India) is incorporated with modern medical practice. The innovations reviewed in this article are sufficiently promising to warrant a major change in policy and direction permitting programs of the type described in the case studies to be fostered, extended, adapted, and used as examples for a large scale global program.

HRP-0013245/6 PC A09
Michigan Univ., Ann Arbor. School of Public Health.
Some Health Sector Analysis Methods for Developing Nations
Lawrence H. Stiffman. May 74, 185p

Descriptors: *Health planning, System analysis, Strategy, Quality assurance, Methodology, Measurement, Health care, Health care utilization, Health care facilities, Health care costs, Forecasting, Data processing, Data processing systems, Data analysis, Cost effectiveness, Benefit cost analysis.

Quantitative methods and techniques for health planning and management are described in a manual directed to developing nations. The catalog of health sector analysis methods has two purposes: (1) to present a selection of past analyses of components of the health sector; and (2) to evaluate these analyses in terms of their ability to identify choices in allocating scarce resources among competing objectives, activities, or strategies; to evaluate the consequences of alternative decisions in terms of health, economic improvement, and cost; and to identify the preferred alternative given available information, skills, and resources. Application of health sector analysis techniques is described at the national, regional, single facility, and single program level. The manual opens with a discussion of the constraints in using quantitative methods and techniques. Program budgeting applications are then described in both developed and developing countries, and examples of cost-effectiveness analysis are offered for cholera and malaria. Forecasting and operations research techniques are described at the health program management level. Examples are

presented of methods for identifying data, organizing data into information, and analyzing and managing information in decisionmaking. Methods included are time series analysis, regression analysis, simple population and utilization projections, queuing and inventory theory, and network analysis. Analytic or optimizing models, including linear and dynamic mathematical programming and Markovian analysis, are described. Allocation models are described for decisionmaking in regard to tuberculosis, allocating, personnel moving patients, and environmental health. Supporting data, graphs, flow diagrams, and a bibliography are included.

HRP-0016123/2 PC A04/MF A01
Pan American Health Organization, Washington, D.C.

Guide for the Organization of Health Services In Rural Areas and the Utilization of Auxiliary Personnel
1975, 72p

Paper is the recommendations of two PAHO/WHO Working Groups convened in Washington, D.C., in April 1974.

Descriptors: *Rural health services, *Health planning, Sanitation, Rural areas, Policies, Pediatrics, Objectives, Methodology, Health resources, Health manpower, Health care services, Guidelines, Foreign countries, Environmental health, Children, Child health services.

The overall objective of the two multidisciplinary working groups of the Pan American Health Organization was to develop a methodology for planning, organizing, and controlling programs in order to extend the coverage of health programs in rural areas. An organizational methodology is proposed for the extension of health service coverage to rural areas. The methodology is programmatic and involves an analysis of the situation, the definition of objectives and target populations, the determination of requirements, and execution. The proposed rural health program has three subprograms: (1) health care (maternal and child health and other direct health activities); (2) basic sanitation (water and excreta); and (3) statistics (statistics for health services and vital statistics). The role of rural communities in the utilization of health services and the implementation of the proposed rural health program is discussed. Functions and training requirements for auxiliary personnel working in rural areas are identified. Data are tabulated on the assignment of tasks in a rural health program. The infrastructure of the proposed rural health program is detailed, with emphasis on planning, organization, execution, control, and supervision. Forms and guidelines are included for the conduct of a rural health program. A list of references is provided.

JPRS-43442 PC A02 MF A01
Joint Publications Research Service, Washington, D.C.
North Vietnam: Translations No. 288.
24 Nov 67, 22p

Descriptors: *Agriculture, *Vietnam, Water supplies, Tropical regions, Cereals, Production, Plants(Botany), Irrigation systems, Distribution(Economics).

Contents: Water conservancy to help make the winter-spring crop succeed; Ministry of Agriculture discusses measures to direct winter-spring crop; Rational irrigation for the fifth-month rice crop; Drought problems; Encouraging the large-scale production of organic fertilizer; Improving commodity distribution for peasants in Thai Binh Province; The need for increased production and supply of goods for feminine use; The need for families to plant medicinal plants.

JPRS-57636 PC A03/MF A01
Joint Publications Research Service, Arlington, Va.
Analysis of Virgin-Land Grain Raising
F. T. Morgun. 30 Nov 72, 41p
Trans of mono. from Dumy O Tseline, Moscow, 1969 p110-151.

SELECTED APPROPRIATE TECHNOLOGIES

Descriptors: *Grain crops, Land use, *Agronomy, USSR, Plant growth, Weeds, Wheat plants, Corn plants, Arid land, Translations.
Identifiers: Virgin land.

The report discusses the problems encountered in developing the virgin lands in the period 1958-1965. (Author)

LA-DC-13156 PC A02/MF A01
 Los Alamos Scientific Lab., N. Mex.
Waste Management In a Small, Widely Dispersed Mountain Community
 L. A. Emelity, R. Garde, and C. W. Christenson.
 1971, 25p Rept no. CONF-720618-1
 From 6. International Conference On Water Pollution Research-Jerusalem, Israel (18 Jun 1972).

Descriptors: *Los alamos area N.

For abstract, see NSA 26 20, number 48486.

LA-6489 PC A02/MF A01
 Los Alamos Scientific Lab., N.Mex.
Appropriate Technology and Navajo Economic Development
 C. D. Kolstad, D. P. Grimmer, P. Reno, and J. M. Tutt. Oct 76, 13p
 Contract W-7405-eng-36

Descriptors: *Communities, *Economics, *Rural populations, *USA, Capital, Comparative evaluations, Economic development, Feasibility studies, Implementation, Materials, Minerals, Production, Socio-economic factors, Technology assessment. **Identifiers:** ERDA/290200, American Indians, Navajo Indians.

The history and economic status of the Navajo Indian Tribe are reviewed briefly. As measured by several yardsticks of economic well-being, the Navajo fall significantly below the rest of the United States. The Navajo have adopted an economic development plan "to bring the Navajo up to an equal footing with the rest of the nation." In view of these factors and the traditional rural settlement patterns of the Navajo, it is proposed that economic development within the Navajo Nation be aimed at encouraging increased productivity at a local level, in harmony with traditional values and lifestyles. Technology should be developed and adapted that can complement current Navajo life patterns. Technology appropriate for the Navajo would be of low capital cost, reliable, labor-intensive, personally satisfying to use, and decentralized. It is argued that appropriate technology can provide an increased material standard of living while permitting continuation of dispersed settlement patterns and traditional values. It is suggested that a Center be established as part of the Navajo Community College to develop appropriate technological aids for the Navajo and to implement this technology within the vast Navajo Nation. A possible structure for such a Center is offered, and it is suggested that a detailed study be undertaken to determine the feasibility of establishing the Center. (ERA citation 02:013726)

LBL-5927 PC A03/MF A01
 California Univ., Berkeley. Lawrence Berkeley Lab.
Ecological Considerations of the Solar Alternative
 M. Davidson, D. Grether, and K. Wilcox. Feb 77, 48p
 Contract W-7405-ENG-48

Descriptors: *Solar energy conversion, *Wind power, *Environmental impacts, Agriculture, Biomass, Ecosystems, Environmental effects, Ocean thermal power plants, Process heat, Solar air conditioners, Solar cells, Solar heating systems. **Identifiers:** ERDA/140400, ERDA/170500, Biological energy conversion, Photovoltaic cells, Solar cells.

The main solar technologies are considered including solar thermal power, photovoltaic cells, ocean thermal power, wind energy, solar heating and cooling, biconversion, and agricultural and process heat. The direct and indirect ecological and environmental impacts of these technologies are discussed. (ERA citation 02:040426)

LBL-6182 PC A04/MF A01
 California Univ., Berkeley.
Feed and Food from Desert Environments
 J. A. Bassham. Sep 77, 53p Rept no. CONF-770960-1
 Contract W-7405-ENG-48
 International workshop on bio-saline research, Kiawah Island, SC, USA, 17 Sep 1977.

Descriptors: *Arid lands, *Farm crops, *Hydrocarbons, *Lubricating oils, *Proteins, Agriculture, Carbohydrates, Biological adaptation, Biosynthesis, Climates, Deserts, Irrigation, Nutrients, Plant breeding, Research programs, Socio-economic factors, Terrestrial ecosystems, Water supply, Biomass, Ecosystems, Energy sources, Lubricants, Organic compounds, Petroleum products, Renewable energy sources. **Identifiers:** ERDA/510100, ERDA/553000, Jojoba oils, Euphorbic, Jojoba, Prosopis juliflora.

Research programs on controlled environmental agricultural technology to allow a broad range of conventional and unconventional crops to be grown with very limited supplies of fresh or brackish water are reviewed. The use of water derived from the sea, from saline lakes, or from waste water treatment for crops in arid lands is discussed. Plant breeding programs to improve the nutritional value of food crops and irrigation systems to improve plant productivity are discussed. The production of liquid hydrocarbons and lubricating oils from plant species such as Euphorbic and Jojoba, and the use of leguminous plants such as mesquite (*Prosopis juliflora*), and other native plants, which thrive in arid regions, as important sources of proteins and carbohydrates are cited as examples of the productive potential of arid lands. 41 references. (ERA citation 03:015879)

LBL-7214 PC A03/MF A01
 California Univ., Berkeley, Lawrence Berkeley Lab.
Potential of Arid Zone Vegetation as a Source of Substrates
 J. A. Bassham. Nov 77, 44p Rept no. CONF-771158-1
 Contract W-7405-ENG-48
 Seminar on microbial conversion systems for food and fodder production and water management, Kuwait City, Kuwait, 12 Nov 1977.

Descriptors: *Agriculture, *Arid lands, *Plants, Biochemical reaction kinetics, Carbon dioxide, Controlled atmospheres, Cultivation techniques, Deserts, Efficiency, Energy sources, Food, Forecasting, Photosynthesis, Plant growth, Productivity, Reviews, Solar energy conversion. **Identifiers:** ERDA/140504, Biological energy conversion.

Three aspects of the potential of vegetation in arid zones as a source of substrates are discussed. The first includes the limitations on efficiency of conversion of solar energy to the stored chemical energy of biomass in green plants, and the subsequent biochemical pathways of carbon dioxide fixation and biosynthesis. Second is the potential of plants endogenous to arid zones. Finally, the use of covered agriculture or controlled environmental agriculture (CEA) is considered both in its present form and in terms of possible extension to the large scale production of stable crops. (ERA citation 03:030556)

NSF/RA-760184 PC A08/MF A01
 Institute of Gas Technology, Chicago, Ill.
Wind-Powered Hydrogen Electric Systems for Farm and Rural Use. Final Report, May-December 1975
 R. R. Tison, N. P. Biederman, T. Donakowski, R. H. Elkins, and J. B. Pangborn. Apr 76, 168p

Descriptors: *Wind turbines, *Hydrogen production, Farms, Economics, Electric power, Energy consumption, Energy storage, Feasibility studies, Power generation, Power supplies, Rural areas. **Identifiers:** ERDA/170601, *Wind power generation.

The objective of this study has been to determine the current technology of a wind-energy conversion system (WECS) of minimal cost for rural applications. Specifically, IGT has evaluated available

methods for converting shaft horse-power from a wind turbine to electricity and hydrogen. A workable mix of these two energy forms with storage that can support the energy needs of selected farming operations and the rural home was sought. Energy load patterns of several farming operations were examined for interfacing with the energy storage and delivery systems that are supplied by wind turbines dependent on the prevalent winds. Several preliminary designs have been completed so that a follow-up program for developing detailed designs and demonstration units can be implemented if desired. (ERA citation 03:030701)

NTIS/PS-75/655/1 PC N01/MF N01
 National Technical Information Service, Springfield, Va.
Synthetic Fuels from Municipal, Industrial, and Agricultural Wastes (A Bibliography with Abstracts)
 Rept. for 1964-Aug 75
 Edward J. Lehmann. Aug 75, 41p*

Descriptors: *Solid waste disposal, *Bibliographies, *Energy sources, *Synthetic fuels, *Reclamation, Refuse, Organic wastes, Agricultural wastes, Sewage, Waste papers, Wood wastes, Methane, Oils, Ammonia, Carbon monoxide, Methyl alcohol.

The bibliography covers research efforts aimed at aspects of producing synthetic fuels--gases and liquids--from solid wastes. These wastes include manure, sewage, paper and wood. In most citations, methane is the primary fuel produced; however the production of oils, ammonia, carbon monoxide, and methyl alcohol is also discussed. (Contains 36 abstracts)

NTIS/PS-77/0112/1 PC N01/MF N01
 National Technical Information Service, Springfield, Va.
Synthetic Fuels from Municipal, Industrial, and Agricultural Wastes (Citations from the NTIS Data Base)
 Rept. for 1964-Feb 77
 Audrey S. Hundemann, and Edward J. Lehmann. Mar 77, 88p*
 Supersedes NTIS/PS-76/0795, and NTIS/PS-75/655. See also NTIS/PS-77/0113.

Descriptors: *Bibliographies, *Synthetic fuels, *Solid waste disposal, *Energy sources, *Reclamation, Refuse, Organic wastes, Agricultural wastes, Sewage, Waste papers, Wood wastes, Methane, Oils, Ammonia, Carbon monoxide, Methyl alcohol.

Research efforts directed toward production of gaseous and liquid synthetic fuels from solid wastes are discussed. Waste products used in the syntheses include manure, sewage, paper, and wood. In most citations, methane is the primary fuel produced; however, the production of oils, ammonia, carbon monoxide, and methyl alcohol is also discussed. (This updated bibliography contains 83 abstracts, 12 of which are new entries to the previous edition.)

NTIS/PS-77/0113/9 PC N01/MF N01
 National Technical Information Service, Springfield, Va.
Synthetic Fuels from Municipal, Industrial and Agricultural Wastes (Citations from the American Petroleum Institute Data Base)
 Rept. for 1975-Nov 76
 Mar 77, 237p*
 See also NTIS/PS-77/0112.

Descriptors: *Bibliographies, *Synthetic fuels, *Solid waste disposal, *Energy sources, *Reclamation, Refuse, Organic wastes, Agricultural wastes, Sewage, Waste papers, Wood wastes, Methane, Oils, Ammonia, Carbon monoxide, Methyl alcohol, Sludge, Garbage, Chips, Automobile tires.

The bibliography cites worldwide literature on the production of fuels from waste materials such as animal manure, wood chips, sewage sludge, urban garbage, agricultural wastes, and old automobile tires. (Contains 226 abstracts)

SELECTED APPROPRIATE TECHNOLOGIES

N71-27143

PC A02
Commissariat A L'Energie Atomique, Fontenay-Aux-Roses (France). Département de La Physique Du Plasma Et de La Fusion Contrôlée.

Change In the Polarization of an Electromagnetic Wave in a Sheared Magnetic Field

R. Cano, C. Etievant, I. Fidone, and B. Zanfagna. 1970, 4p Rept nos. CEA-CONF-1608, CONF-700817-11

Conf. Presented At 4th European Conf. on Controlled Fusion and Plasma Phys., Rome, 31 Aug.-4 Sep. 1970

Descriptors: *Electromagnetic radiation, *Magnetic fields, *Plasma control, *Polarization (waves), Conferences, Propagation modes.

For abstract, see STAR 0915

N72-28508

PC A02/MF A01
Scientific Translation Service, Santa Barbara, Calif.

Problems in the Construction of Woodworking Machines

W. Schmutzler. Jul 72, 24p Rept no. NASA-TT-F-14398

Contract NASW-2035

Transl. Into English From Holz Roh. Werkstoff (Berlin), V. 26, No. 7, Jul. 1968 P 237-243

Descriptors: *Machine tools, *Roller bearings, *Shafts (machine elements), *Wood, Loads (forces), Lubrication, Noise reduction, Spindles.

For the construction of modern wood working machines, problems such as the most favorable tool spindle and shaft bearings play an important part. The construction and functional details of these machines are considered. The interrelationships are discussed of speed, bearing load, fit and lubrication, as well as bearing devices and their installation. The particulars of motor shaft bearings are considered along with questions concerning oscillating shafts. Another, equally important construction detail is the chip suction system. Defects that might occur in the construction of suction hoods or at the machines themselves are described. Finally, questions of noise abatement, its cause and elimination are discussed. (Author)

N74-15752/0

PC A02/MF A01
Kanner (Leo) Associates, Redwood City, Calif.
Utilization of Wind Power in Agriculture in the USSR

D. Stein. Feb 74, 13p Rept no. NASA-TT-F-15345

Contract NASW-2481

Transl. Into English from Elektrizaetswirtschaft (West Germany), V. 40, No. 4, 5 Feb. 1941 p 54-56.

Descriptors: *Agriculture, *Windpower utilization, U.

Identifiers: NASA.

Wind motors are being used in Russian agriculture for milling and pumping water. Plans call for rapid expansion of the utilization of such power plants. The extent of present utilization, problems, and forecasts are outlined. (Author)

N74-16801/4

PC A02/MF A01
Linguistic Systems, Inc., Cambridge, Mass.
Using the Energy of the Wind for Electrification

V. R. Sektorov. Feb 74, 18p Rept no. NASA-TT-F-15307

Contract NASW-2482

Transl. Into English from Elektrichestvo, (Ussr), No. 3 March 1953 p 11-16.

Descriptors: *Agriculture, *Electric power supplies, *Windpowered generators, Electric power plants, Flywheels, Rural areas, Windpower utilization.

Identifiers: NASA.

The utilization of wind energy for generating electric power is discussed. Existing power generators utilizing wind energy are described and their use in agriculture is indicated. (Author)

N75-14827/0

PC A04/MF A01
Hercules, Inc., Magna, Utah. Bacchus Works.
Manufacture and Static Firing of X259-E6 Rocket Motor Serial Number XJ04/0001.

Final Report.

D. R. Robertson. 28 Jan 75, 69p Rept no. NASA-CR-132557

Contract NAS1-10000

Subm-Prepared for LTV Aerospace Corp., Dallas.

Descriptors: *Double base propellants, *Engine tests, *Propellant tests, *Rocket engines, *Static firing, Engine design, Failure, Rocket nozzles.

A single motor was cast and static fired to demonstrate the performance of high energy crosslinked double base (XLDB) propellant in standard X259 rocket motor hardware. Prior to motor fabrication, the motor was analyzed to predict the results of static firing the X259 motor loaded with XLDB propellant. As a result of the analyses, a forward dome shrinkage liner was added to the design. With this design change it was determined that adequate margins of safety existed. The motor, designated the X259-E6 model with serial number XJ04/0001, was fabricated using a slurry-casting technique and was assembled with a standard X259-B4 nozzle which had the nozzle throat machined to a smaller inside diameter than the B4 model and the exit cone cut short for Bacchus Works altitude expansion. The motor was static fired on 20 February 1974 with the nozzle failing during motor operation. Nozzle failure was attributed to spalling of the throat material leading to complete nozzle break-up. However, the propellant functioned as predicted in the motor chamber, ignition was normal, and char and erosion of the internal insulator were as expected. (Author)

N75-17045/6

PC A06/MF A01
World Meteorological Organization, Geneva (Switzerland).

A Survey of Meteorological and Hydrological Data Available in Six Sahelian Countries of West Africa. A Survey of Studies in Meteorology and Hydrology in the Sudano-Sahelian Zone of West Africa.

E. G. Davy. 1974, 125p Rept no. WMO-379

Partly in English and Partly in French.

Descriptors: *Africa, *Agriculture, *Drought, *Economic development, *Meteorological services, *Precipitation (Meteorology), Chad, Hydrometeorology, Mali, Mauritania, Niger, Rain, Senegal, Upper volta, Weather stations.

A meteorological and hydrological survey was made in six West African countries, namely, Upper Sahel, Upper Volta, Mali, Mauritania, Niger, Senegal, and Chad. The survey was carried out in conjunction with an economic development program particularly oriented to the severe drought problem of the Sahelian regions. Urgent investigation is needed in four areas: weather/crop correlations, weather/run-off correlations and maps of agricultural and water resources potential, periodic recurrence and persistence of rainfall, and droughts in relation to general atmospheric circulation. A list of stations and their services is included.

N75-27567/7

PC A03/MF A01
Hampton Inst., Va. Dept. of Agriculture.
Space and Energy Conservation Housing Prototype Unit Development.

Final Report, Apr. - Aug. 1975.

D. R. Sunshine. Aug 75, 50p Rept no. NASA-CR-143201

Grant NSG-1162

Descriptors: *Architecture, *Energy conservation, *Prototypes, Buildings, Construction, Construction materials, Energy policy, Solar energy, Urban development.

Construction plans are discussed for a house which will demonstrate the application of advanced technology to minimize energy requirements and to help direct further development in home construction by defining the interaction of integrated energy and water systems with building configuration and construction materials. Housing unit designs are provided and procedures for the

analysis of a variety of housing strategies are developed. (Author)

N76-10569/1

PC A07/MF A01
Ohio Agricultural Research and Development Center, Wooster.
Grown Organic Matter as a Fuel Raw Material Resource.

Final Report.

W. L. Roller, H. M. Keener, R. D. Kline, H. J. Mederski, and R. B. Curry. Oct 75, 134p Rept no. NASA-CR-2608

Contract NGL-36-007-001

Descriptors: *Agriculture, *Crop growth, *Earth resources, *Fuels, *Organic materials, Cellulose, Cost analysis, Fibers, Food, Photosynthesis, Production management, Solar energy.

An extensive search was made on biomass production from the standpoint of climatic zones, water, nutrients, costs and energy requirements for many species. No exotic species were uncovered that gave hope for a bonanza of biomass production under culture, location, and management markedly different from those of existing agricultural concepts. A simulation analysis of biomass production was carried out for six species using conventional production methods, including their production costs and energy requirements. These estimates were compared with data on food, fiber, and feed production. The alternative possibility of using residues from food, feed, or lumber was evaluated. It was concluded that great doubt must be cast on the feasibility of producing grown organic matter for fuel, in competition with food, feed, or fiber. The feasibility of collecting residues may be nearer, but the competition for the residues for return to the soil or cellulosic production is formidable. (Author)

N76-71498/9

PC A05/MF A01
Comptroller General of the United States, Washington, D.C. Resources and Economic Development Div.

Using Solid Waste to Conserve Resources and to Create Energy. Environmental Protection Agency. Report to the Congress

27 Feb 75, 79p Rept nos. RED-76-326, B-166506

Descriptors: *Solid waste disposal, *Materials recovery, *Fuels, *Management planning, Government policies, Reclamation, Regulations, Refuse disposal, Separation, Waste processing, Economic analysis, Metal scrap, Incinerators, Research management.

Identifiers: *Waste recycling, Oil wastes, Pyrolysis incineration.

Contents: Resource recovery: What it is and why it is important; Progress in implementing provisions of the resource recovery act has been slow; Major issues confronting resource recovery, recycling, and reuse; Energy recovery from solid waste; The Federal role in assisting States and Localities in establishing resource recovery programs; Scope of review. Portions of this document are not fully legible.

N77-13537/4

PC A02/MF A01
National Aeronautics and Space Administration, Lewis Research Center, Cleveland, Ohio.
Status of the Erda/NASA Photovoltaic Tests and Applications Project.

J. N. Deyo, H. W. Brandhorst, Jr., and A. F. Forestieri. 18 Nov 76, 10p Rept no. NASA-TM-X-73567

Conf. Presented to the 12TH Photovoltaic Specialists Conf., 15-18 Nov. 1976; Sponsored by the Inst. Of Electrical and Electronic Engineers.

Descriptors: *Photovoltaic conversion, *Silicon, *Solar arrays, *Solar energy conversion, Accelerated life tests, Low cost, Marketing, Performance, Solar cells, Technology utilization.

The Tests and Applications Project of the ERDA Photovoltaic Program is concerned with the testing of photovoltaic systems and the growth of their use in real terrestrial applications. This activity is an important complement to the development of

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low cost solar arrays by providing requirements based on application needs and stimulating markets to create demand to absorb increasing production capacity. A photovoltaic system test facility is now operational, market stimulation has been initiated through applications, and standards for terrestrial cell measurements established.

N77-18954/6 PC A15/MF A01
 California Univ., Berkeley.
They Watch and Wonder. Public Attitudes Toward Advanced Technology.
 Final Report.
 T. Laporte, and D. Metlay. Dec 75, 344p Rept no. NASA-CR-149673
 Contract NGR-05-003-0471

Descriptors: *Data acquisition, *Public relations, *Research and development, *Social factors, *Technology transfer, Air transportation, Human tolerances, Land use, Rural areas, Tables (Data). Identifiers: Communities, Surveys.

The relationship of technological development to individual and community response was investigated to provide a general conceptual, as well as empirical basis, for an understanding of the impact of advanced technologies on social life. Results of the surveys are presented in tables and graphs.

N78-10603/6 PC A02/MF A01
 International Atomic Energy Agency, Vienna (Austria).
Energy In Developing Countries: Prospects and Problems.
 V. Baum. 1977, 17p Rept nos. IAEA-CN-36/581, CONF-770505-235
 Conf-Presented at Nucl. Power and Its Fuel Cycles, Salzburg, Austria, 2 May 1977.

Descriptors: *Energy policy, Developing nations, Energy consumption, Economics, Management planning, Social factors.

Identifiers: *Developing countries, Energy requirements, *Energy demand.

Requirements for primary energy and electric power in the developing countries are analyzed in the light of projections of population and economic growth, the availability of indigenous energy resources, and input requirements (capital, technology, trained personnel) for accelerated energy development. Possible supplies for such inputs from domestic sources, transnational corporations, multilateral institutions, and through co-operation among the developing countries themselves and between the developing and the developed countries are reviewed.

N78-11653/0 PC A07/MF A01
 World Meteorological Organization, Geneva (Switzerland).
Guidelines for Disaster Prevention and Preparedness In Tropical Cyclone Areas.
 1977, 135p
 Subm-Prepared Jointly with Econ. And Social Comm. For Asia and the Pacific and League of Red Cross Soc.

Descriptors: *Cyclones, *Weather forecasting, Preparation, Prevention, Disasters, Floods, Land use, Storm damage, Tropical storms, Warning systems.

Identifiers: Switzerland.

Following a general introduction and background information, forecasts and warnings of tropical cyclones, river floods, and storm surges are reviewed. The role of disaster prevention in national planning is discussed together with legislation for disaster prevention, risk evaluation, land use, and zoning and building codes. Planning and legislation for disaster preparedness are summarized along with aspects such as tropical cyclone warning systems, flood fighting, evacuation of danger areas, public education and information, and test exercises and emergency operations. Finally, disaster rehabilitation and resettlement and assessment of damage are discussed.

N78-17466/1 PC A03/MF A01
 National Aeronautics and Space Administration, Lewis Research Center, Cleveland, Ohio.
Wind Turbine Generator Rotor Blade Concepts with Low Cost Potential.
 T. L. Sullivan, T. P. Cahill, D. G. Griffee, Jr, and H. W. Gewehr. Dec 77, 38p Rept nos. NASA-TM-73835, DOE/NASA-1028-77/13
 Contract E(49-26)-1028
 Conf-to Be Presented at the 23RD Natl. Sampe Symp., Anaheim, Calif., 2-4 May 1978.

Descriptors: *Rotor blades (Turbomachinery), *Turbine blades, Low cost, Product development, Turbogenerators, Windpowered generators.
 Identifiers: *Wind turbines.

Four processes for producing blades are examined. Two use filament winding techniques and two involve filling a mold or form to produce all or part of a blade. The processes are described and a comparison is made of cost, material properties, design and free vibration characteristics. Conclusions are made regarding the feasibility of each process to produce low cost, structurally adequate blades.

N78-19616/9 PC A13/MF A01
 National Aeronautics and Space Administration, Lewis Research Center, Cleveland, Ohio.
Wind Turbine Structural Dynamics.
 D. R. Miller. 1978, 280p Rept nos. NASA-CP-2034, DOE-CONF-771148
 Conf-Workshop Held at Cleveland. 15-17 Nov. 1977; Sponsored by Doe.

Descriptors: *Mechanical drives, *Turbines, *Windpowered generators, Dynamic loads, Dynamic structural analysis, Energy conversion, Low cost, Stability derivatives, Vibrational stress, Wind-power utilization.
 Identifiers: *Wind turbines.

For abstract, see STAR 1610

N78-25012/3 PC A03/MF A01
 National Aeronautics and Space Administration, Washington, D. C.
Waste Heat Utilization In Industrial Processes.
 M. Weichsel, and W. Heitmann. Apr 78, 35p Rept no. NASA-TM-75210
 Contract NASW-2791

Descriptors: *Cooling systems, *Heat exchangers, *Heat pumps, Economic development, Industrial plants, Waste energy utilization.
 Identifiers: Translations, *Waste heat utilization, West Germany.

A survey is given of new developments in heat exchangers and heat pumps. With respect to practical applications, internal criteria for plant operation are discussed. Possibilities of government support are pointed out. Waste heat steam generators and waste heat aggregates for hot water generation or in some cases for steam superheating are used. The possibilities of utilization can be classified according to the economic improvements and according to their process applications, for example, gas cooling. Examples are presented for a large variety of applications.

ORNL-5024 PC A07/MF A01
 Oak Ridge National Lab., Tenn.
Assessment of the Environmental Impact of Alternative Energy Sources.
 S. E. Beall, I. Spiewak, H. G. Arnold, H. W. McLain, and E. S. Bettis. Sep 74, 134p
 Contract W-7405-eng-26

Descriptors: *Geothermal energy, *Environmental effects, *Solar energy, Environmental effects, *Thermonuclear reactors, Environmental effects, *Energy sources, Environmental effects, Environment.

Identifiers: ERDA/295500, ERDA/293500, ERDA/140400, ERDA/150600, ERDA/700200.

Several energy sources, including solar, geothermal, and fusion processes, have been presented in the press as being low-cost and nonpolluting and proclaimed as solutions to the energy crisis.

This report provides information related to technical feasibility, economic practicality, and commercial availability of these sources, and attempts to assess their environmental effects. Specifically, three concepts of geothermal energy extraction, artificial and natural means of collecting solar energy, and a typical thermonuclear energy generator are discussed. The authors point out that this report was prepared during the Summer and Fall of 1973, but was not completed because funding for the project was canceled early in 1974. Although the work was completed by one of the authors (Beall) on a part-time basis early in 1975, there was no time to update the material to reflect the changes in technology during the interim; thus, much of the referenced technological material and cost data are somewhat out of date. In spite of this shortcoming, Dr. Beall feels that the treatment of environmental effects and the suggested methodology for comparing the impacts of the alternative energy systems remain pertinent and provide a basis for additional generic and site-specific studies. (146 references).

PAT-APPL-566 493 PC A02/MF A01
 National Aeronautics and Space Administration, Pasadena Office, Calif.
Solar Powered Pump.
 Patent Application.
 C. C. Kirsten. Filed 9 Apr 75, 19p N75-22746/2, NASA-CASE-NPO-13567-1
 Contract NAS7-100
 Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Arid lands, *Farm crops, *Irrigation, *Pumps, *Water flow, *Patent applications, Low cost, Solar energy.

A low cost water pump suitable for use in agricultural irrigation in underdeveloped regions is disclosed. The pump is adopted to use unconcentrated sunlight as a source of energy and atmospheric air as a working fluid for intermittently delivering a stream of water from a given source.

PAT-APPL-598 969 PC A04/MF A01
 National Aeronautics and Space Administration, Pasadena Office, Calif.
Low Cost Solar Energy Collection System.
 Patent Application.
 C. G. Miller, and J. B. Stephens. Filed 24 Jul 75, 57p N75-28519/7, NASA-CASE-NPO-13579-1
 Contract NAS7-100
 Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Cost reduction, *Solar energy absorbers, *Solar reflectors, *Patent applications, Equipment specifications, Pipes (Tubes), Product development.

A fixed, linear, ground-based primary reflector is described which has an extended curved-sawtooth contoured surface covered with a metallized polymeric reflecting material; It reflects solar energy to a movably supported collector that is kept at the concentrated line focus of the reflector primary. The primary reflector was constructed by a process utilizing freeway paving machinery. The solar energy absorber is preferably a fluid-transporting pipe. Efficient utilization leading to high temperatures from the reflected solar energy was obtained by cylindrical shaped secondary reflectors that direct off-angle energy to the absorber pipe. Refocusing secondary reflectors which cause a series of discrete spots of highly concentrated solar energy to fall on the fluid-transporting pipe were used to obtain higher temperature levels. A serial arrangement of cylindrical secondary reflector stages and spot-forming reflector stages produces a high temperature solar energy collection system of greater efficiency.

PAT-APPL-617 202 PC A03/MF A01
 National Aeronautics and Space Administration, Pasadena Office, Calif.
Lightweight Reflector Assembly and Method.
 Patent Application.
 M. J. Argoud, J. Jolley, and W. L. Walker. Filed 24 Sep 75, 29p N75-32894/8, NASA-CASE-NPO-13707-1

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Contract NAS7-100
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Fabrication, *Low cost, *Solar reflectors, *Patent applications, Glass, Parabolic reflectors, Substrates.

An invention for a lightweight solar reflector assembly having a glass cellular substrate and a method of forming the reflector assembly was described. The novelty of the invention appears to reside in the method of forming a large low cost reflective surface for use in a solar concentrator or antenna. The invention also includes the reflective component combination of a lamina glass reflective surface and a lightweight cellular glass substrate having the same coefficient of thermal expansion to provide a high quality optical reflective surface. (Author)

PATENT-3 331 356 Not available NTIS
Department of the Interior, Washington, D.C.
Sterilization of Fish in Their Aquatic Environment to Produce Maximum Size and Weight per Unit of Water Surface

Patent
Benjamin Eckstein. Filed 22 Nov 65, patented 18 Jul 67, 2p PB-228 200/2, PAT-APPL-519 820
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 \$0.50.

Descriptors: *Fishes, *Sterilization, *Patents, *Sterility, Weight(Mass), Size determination, Growth, Brackish water, Aquaculture, Estogens, Mortality.

Identifiers: PAT-CL-119-3, Tilapia, Fish sterilization, GPINT.

The invention relates to a method for sterilizing fish, especially Tilapia. In particular, the method comprises the gonadal destruction of Tilapia fry at an age of about four to eight weeks by introducing into water containing the fry an estrogenic composition in small concentrations.

PATENT-3 984 266 Not available NTIS
Department of the Navy Washington DC
Process for Bonding a Ferro-Cement Structure with Fiberglass Reinforced Plastic

Patent
Kenneth A. Christensen, and Robert B. Williamson. Filed 22 Apr 74, patented 5 Oct 76, 5p AD-D003 818/2, PAT-APPL-462 827
Supersedes PAT-APPL-462 827-74, AD-D001 591.

Availability: This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231. \$0.50.

Descriptors: *Patents, *Adhesive bonding, *Cements, *Glass reinforced plastics, Bonding, Adhesives, Fiberglass, Construction materials, Hulls(Marine).

Identifiers: PAT-CL-156-3, Ferrocement.

A process is described for bonding a glass fiber reinforced plastic to a ferro-cement structure to improve impact strength of the ferro-cement structure, comprising the steps curing the ferro-cement mortar; acid etching the mortar on the side of the ferro-cement mortar to which the glass fiber reinforced plastic is to be bonded; rinsing the mortar, drying the mortar, applying a coat of adhesive to the mortar and attaching the glass fiber reinforced plastic to the bonded mortar surface. The adhesive may be partially cured if desired. (Author)

PATENT-4 035 065 Not available NTIS
National Aeronautics and Space Administration, Pasadena Office, Calif.

Lightweight Reflector Assembly.

Patent
M. J. Argoud, J. Jolley, and W. L. Walker. Filed 24 Sep 75, patented 12 Jul 77, 9p N77-28933/8
Supersedes PAT-APPL-617 202-75, N75-32894.
Subm-Sponsored by NASA.

This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing.

Copy of patent available Commissioner of Patents, Washington, D.C. 20231 \$0.50.

Descriptors: *Fabrication, *Solar reflectors, *Paraboloid mirrors, *Patents, Optical reflection, Structural design, Composite structures, Glass, Coatings, Low cost.
Identifiers: PAT-CL-350-310.

An inexpensive, lightweight reflective assembly member having good optical quality is described. It is adaptable to accommodating temperature variations without providing destructive thermal stresses and reflective slope errors. The reflective assembly consists of a thin sheet of glass with appropriate reflective coating and a cellular glass block substrate bonded together. The method of fabrication includes abrading the cellular substrate with an abrasive master die to form an appropriate concave surface. An adhesive is applied to the abraded surface and a lamina reflective surface is placed under a uniform pressure to conform the reflective surface onto the desired abraded surface of the substrate.

PATENT-4 065 053 Not available NTIS
National Aeronautics and Space Administration, Pasadena, Calif.

Low Cost Solar Energy Collection System.

Patent
C. G. Miller, and J. B. Stephens. Filed 24 Jul 75, patented 27 Dec 77, 26p N78-17460/4, PAT-APPL-598 969

This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 \$0.50.

Descriptors: *Solar collectors, *Solar energy absorbers, *Patents, Cost analysis, Equipment specifications, Pipes(Tubes), Product development.
Identifiers: PAT-CL-237-1, Solar reflectors.

A fixed, linear, ground-based primary reflector having an extended, curved sawtooth contoured surface covered with a metallized polymeric reflecting material, reflected solar energy to a movably supported collector that was kept at the concentrated line focus of the reflector primary. Efficient utilization leading to high temperatures from the reflected solar energy was obtained by cylindrical shaped secondary reflectors that directed off-angle energy to the absorber pipe.

PB-163 833
Chicago Univ., Ill.
Tradition, Season, and Change In a Turkish Village.

John F. Kolars. Rept no. FFRP-15
Contract Nonr-2300(09)

Descriptors: *Geography, *Turkey, *Agriculture, Rural areas, Sociology, Economics, Labor.

No abstract available.

PB-166 281 HC A13
Office of Scientific Research and Development, Div. 11.

Fire Warfare: Incendiaries and Flame Throwers.

Summary technical rept., vol. 3

Raymond H. Ewell. 1946, 296p Rept no. STR-11-3
Contract

Descriptors: *Flame warfare, Incendiary ammunition, *Flamethrowers, Flame warfare, *Incendiary bombs, Flame warfare, Incendiary mixtures, Fire bombs, Bomb components, Bomb clusters, Bomb cases, Flamethrower fuels, Tests, Test methods, Tanks(Combat vehicles), Antipersonnel weapons, Design, Theory, Incendiary gels.
Identifiers: M1 Firestarters, H2 Sabotage incendiary, M-69 Bombs, M1 Flamethower, MS-4 Flamethower, E9 Bombs, E7 Flamethower.

This volume describes the research and development work in the fields of incendiaries, flame throwers, and incendiary fuels carried on by the National Defense Research Committee. Chapters 1, 2, and 3 deal with incendiaries, Chapters 4, 5, 6,

and 7 with flame throwers, and Chapter 8 with incendiary fuels.

PB-169 304 PC A02 MF A01
Forest Products Lab., Madison, Wis.
Condensation In Farm Buildings.
Research note.
Jan 66, 9p Rept no. FPL-0114
Contract
Revision of Report no. 1186.

Descriptors: *Buildings, Condensation, *Condensation, Control, *Water vapor, Buildings, Rural areas, Moisture, Humidity, Ventilation, Moisture-proofing, Permeability.

The method of controlling or preventing the condensation in farm buildings and other structures involves a particular set of conditions, each of which must be considered separately. A review of the principles of water vapor and condensation is provided for the purpose of establishing a basis for analyzing the problem. The control of factors contributing to condensation by means of ventilation, vapor-permeable constructions, and vapor barriers is discussed.

PB-169 744 PC A05 MF A01
Maine Dept. of Economic Development, Augusta.
Technical and Economic Feasibility of Establishing a Lightweight Aggregate Plant Using Marine Clays in York County, Maine.
Final rept.
Jul 64, 78p Rept no.
Contract Cc-6021

Descriptors: *Economics, Maine, *Clay, Maine, *Composite materials, Clay, *Industrial production, Composite materials, *Industrial plants, Maine, Mixtures, Pellets, Concrete, Manufacturing methods, Clay minerals, Feldspar, Quartz, Mica, Potassium compounds, Cements, Commerce, Natural resources, Transportation, Extrusion, Sintering, Feasibility studies, Mining engineering, Industries, Driers(Apparatus), Crushers, Storage, Costs, Structural properties.
Identifiers: Area redevelopment, Aggregates(Materials).

Contents: Raw material resource investigation; Analysis and pilot plant tests; Estimates of construction and production costs, Economic feasibility of lightweight aggregate operation.

PB-170 306 PC A10 MF A01
American Scientific Corp., Alexandria, Va.
Creating a Ceramics Industry on the Blackfeet Reservation.
Emmett F. Deady, Saul S. Geftor, Natalie Marra, and Robert F. Custard. Sep 65, 203p
Contract EDA-14-20-0650-1379

Descriptors: *Economics, Montana, *Montana, Industries, *Industries, Ceramic materials, Feasibility studies, Labor, Commerce, Employment, Management engineering.
Identifiers: Ceramics industry, Indian reservations, Area redevelopment.

The study reports that there exists at the Blackfeet Reservation a sufficient labor pool endowed with ceramic production capabilities and that all other factors controlling the success of such an industry are in evidence, provided the enterprise can be financed. It resolves that the plant should be directed to the production of art pottery, particularly fine figurines and pottery designed to reflect the American Indian tradition. It determined that the optimum method of production is slip casting but recommends flexible molding as soon as practical and suggests lines of experiments so directed. The study examines the market for Indian art pottery and recommends specific items at specific prices, and undertakes to predict sales quotas of such items. It shows that there is an annual sales of \$21,000,000 in the U. S. alone of art ceramic items and that there is no commercially produced Indian pottery of any significance at this time. It proposes that a \$100,000 penetration of this market is less than one-half of one percent, and concludes that this is feasible. The study recommends a program of facilities and equipment starting with a 4,940

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square foot plant employing 20 people to be expanded to a 10,000 square foot plant employing 129 people, with a corallary ceramics industry to employ another 125 over a ten year program. It proposes a plan of implementation including management, capital, labor, and facility requirements over a ten year period to be financed with an investment of \$250,000 and shows that a break-even point is possible by the end of the first full year of operation. (Author)

PB-170 327 PC A03 MF A01

Hawaii State Dept. of Planning and Economic Development, Honolulu.

Feasibility of Processing Tropical Fruit Concentrates In Puna, Hawaii.

Jun 65, 48p Rept no.

Contract

Prepared in cooperation with Economic Development Administration, Washington, D. C.

Descriptors: *Economics, Hawaii, *Hawaii, Economics, *Fruits, Beverages, Feasibility studies, Processing, Dehydrated foods, Pectins, Costs, Concentration(Chemistry), Food, Industries.

Identifiers: Area redevelopment.

A pilot plant operation to determine the feasibility of processing tropical fruits with acerola plant equipment was a definite success. The technicians who carried out the pilot plant operation have concluded it is technically possible to produce high quality concentrates from passion fruit, guava and papaya on a commercial scale. No serious technical problems were encountered in the operation. In making these concentrates, the technologists attempted to get the highest brix reading possible instead of stopping at a lower and possibly more practical level of concentration. Subsequent product development work by the technologists proved satisfactory products could be made utilizing these concentrates. These products were jams, jellies, nectar bases, 2nd flavorings. An economic analysis of a projected full-scale commercial operation resulted in a very optimistic profit picture. These results apply only to the Puna District of Hawaii which offers unique advantages to the proposed operation. (Author)

PB-173 709 PC A03 MF A01

Coordination Center for Southeast Asian Studies Bangkok (Thailand).

Metalworking Equipment in Thailand.

Jul 63, 27p

Prepared in cooperation with Business and Defense Services Administration, Washington, D. C.

Descriptors: *Metal-forming presses, Commerce, *Industries, Metal-forming presses, Thailand, Machine tools, Presses(Machinery), Small tools.

It is recommended that certain items of metal working equipment be exhibited in Thailand but only if they are produced in America in sizes which are appropriate for small industries, and at prices which can be paid by individuals. Further, it is recommended that any type of display must take account of the lack of knowledge, on the part of the small Chinese industry owner who will buy them, of what machines can do. He must be offered adequate information, explanation and demonstration.

PB-173 710 PC A03 MF A01

Far East Research Organization Ltd., Singapore.

Metal Cutting Machines in Malaya.

May 65, 36p

Prepared in cooperation with Business and Defense Services Administration, Washington, D. C.

Descriptors: *Cutting tools, Commerce, *Commerce, Industries, Small tools, Economics, Metal-forming presses, Malaya, Machine tools.

In general the items likely to be in greatest demand in Malaysia are general purpose metal cutting machines likely to be used in small general purpose workshops. The machines should be robust and any sub assemblies which are difficult to repair should be easily removable for exchange. The market for large or highly specialized machines is not likely to be large for several years.

PB-174 333 PC A03 MF A01
Commonwealth Scientific and Industrial Research Organization, Melbourne (Australia). Div. of Forest Products.

Contributions from Division of Forest Products, CSIRO, to Uncsat Conference 1963.

27 Jun 66, 39p Rept no. Technical paper-46

Descriptors: *Wood, Scientific research, Forestry, Structural properties, Trees, Paper, Climatology, Adhesives, Strength, Preservation, Tropical deterioration, Buildings, Humidity, Protective treatments, Reports, Australia.

Contents: Developing the structural use of native timbers: important technological factors; The behaviour of paper products under extreme climatic conditions; Tannin-formaldehyde adhesives; Preservation of hardwood building timbers with special reference to tropical countries; Timber utilization with special reference to sawing techniques and utilization of waste; Timber seasoning practices for conditions of high humidity in tropical areas.

PB-174 346 PC A04 MF A01
Forest Products Lab., Madison, Wis.
Houses Can Resist Hurricanes.

Research paper

L. O. Anderson, and Walton R. Smith. Aug 65, 52p Rept no. FPL-33

Prepared in cooperation with Southeastern Forest Experiment Station.

Descriptors: *Construction materials, Tropical cyclones, *Housing, Tropical cyclones, Structures, Damage control, Foundations(Structures), Storms.

The report is based on a study of hurricane damage to man-made structures over a period of years. Not all damage can be eliminated, but a very high percentage of damage observed in the past could have been avoided with simple, inexpensive commonsense principles applied to building construction. Some of these principles are demonstrated here--especially in respect to the value of good foundations and the importance of ties between parts of the structure. (Author)

PB-174 673 PC A13 MF A01
International Cooperation Administration, Washington, D. C. Technical Aids Branch.
Small Canning Facilities.

Jun 56, 276p

Descriptors: *Canning, *Industrial plants, Operation, Industrial equipment, Economics, Site selection, Maintenance, Food, Containers, Personnel, Industrial training, Preparation, Processing, Industrial research.

The manual describes the equipment and materials required to establish small cannning facilities. Information on plant layouts is provided, and operation procedures and processing data are presented. Three types of plants or centers are discussed; a small facility utilizing elementary utensils, an intermediate size plant utilizing commercial equipment and a larger plant with centralized steam-generating equipment. (Author)

PB-175 521 PC A09 MF A01
International Cooperation Administration, Washington, D. C. Office of Industrial Resources.
Metal-Working Industry Training Manual.

1957, 184p Rept no. Technical Bull-62

Descriptors: *Instruction manuals, *Machine shop practice, *Industrial training, Material forming, Metals, Dies, Material removal, Heat treatment, Industrial equipment, Operation, Supervisory personnel, Management engineering.

The manual contains material about the manufacturing practices and operational methods in the metal-working industry, relating principally to the use of machine tools and related equipment for manufacturing component parts of final products. It explains the efficient utilization of metal-working equipment, and allied problems of tooling, plant lay-out, methods, and the development of a program to assist the industry on production problems through a training program. This training program

has been developed for senior management personnel, work managers, and foremen for the proper selection of machinery; utilization of machine tools; layout of production line; design, use, and making of jigs and fixtures; problems involving setup, machine loading, machine speeds, testing and quality control, selection of cutting tools, tool designs, tool-making and tool maintenance; and safety devices and programs in the shop. (Author)

PB-175 523 PC A04 MF A01
Agency for International Development, Washington, D. C. Communications Resources Div.

Plant Requirements to Set Up and Operate Small Bread Bakeries.

Mar 60, 63p

Prepared in cooperation with Holman (John F.) and Co., Inc., Washington, D. C.

Descriptors: *Bread, Manufacturing methods, Industrial plants, Specifications, Industrial production, Costs, Labor, Economics, Power, Industrial equipment, Fuels, Transportation, Water.

Contents: General assumptions; Manufacturing operations; Plant site; Building requirements; Plant layout; Power; Water; Fuel; Transportation; Machinery and equipment; Production equipment; Direct labor requirements; Direct materials; Furniture and fixtures; Supplies; Cost breakdown per pound for white bread; Indirect labor cost; Depreciation; Manufacturing overhead; Manufacturing cost (annual); Fixed assets; Working capital; Capital requirements; Sales revenue; Recapitulation of costs, sales, and profits; Training; Sanitation; Safety; Conservation and accounting for losses in baking operations.

PB-175 524 PC A05 MF A01
International Cooperation Administration, Washington, D. C. Technical Aids Branch.

Plant Requirements to Set Up and Operate a Brass Foundry.

Revised ed.

May 59, 85p

Prepared in cooperation with Andrews (George H.) Engineering Associates, Inc., Washington, D. C.

Descriptors: *Industrial plants, Material forming, *Brass, *Material forming, Management engineering, Copper alloys, Aluminum alloys, Magnesium alloys, Casting, Molding, Costs, Industrial equipment, Manufacturing methods.

The manual deals with subjects concerning brass foundry operations and techniques. However, matters pertaining to the casting of other metals in the nonferrous category have been included, since it is quite generally the practice in America to utilize identical facilities to cast brass, bronze, zinc, aluminum, magnesium and other nonferrous metals. The manual includes current costs of labor, machinery, equipment and supplies, as well as additional information relative to engineering, training, safety, markets, sales, financial and economic factors.

PB-175 526 PC A03 MF A01
International Cooperation Administration, Washington, D. C. Technical Aids Branch.

Plant Requirements for Manufacture of Candy and Confectionery.

Sep 57, 48p

Prepared in cooperation with Wolf Management Engineering Co., Chicago, Ill.

Descriptors: *Food, Manufacturing methods, Industrial plants, Industrial production, Specifications, Industries, Industrial equipment, Costs, Management planning.

Identifiers: Confectioneries.

Contents: Candy origin and usage; The candy industry; Requisites of successful confectionery manufacturing; Principal raw materials and their characteristics; Manufacturing processes of basic types of candy; Plant requirements - physical; Plant requirements - quality and costs; Cost ratios in the candy industry; Operating ratios in 1955 - typical for U. S. manufacturer-retailers; Financial forecast; Average cost per pound of selected in-

SELECTED APPROPRIATE TECHNOLOGIES

gredients used by the United States confection industry.

PB-175 531 **PC A06 MF A01**
 International Cooperation Administration, Washington, D. C. Technical Aids Branch.
A Small Sawmill Enterprise.
 Revised ed.
 Apr 59, 101p

Descriptors: *Wood, *Industries, Machine tools, Portable, Saws, Operation, Costs, Labor, Money, Commerce, Law, Safety, Industrial equipment, Storage, Insects, Maintenance, Efficiency, Industrial procurement.

The publication contains machinery and processes for conversion of logs into lumber as an industrial enterprise, including both the mechanical and business aspects. It does not include the processes of extracting logs from forests or the seasoning of products of sawmills. It is intended to be useful to those considering the establishment of a small sawmill business in foreign countries, and may be helpful to some of those already conducting such a business. The selection, erection, and operation of small circular sawmills of standard and traditional types are described. (Author)

PB-175 532 **PC A03 MF A01**
 International Cooperation Administration, Washington, D. C. Technical Aids Branch.
Small Brass Foundry.
 Oct 60, 35p Rept no. TR-26072-PR
 Prepared in cooperation with Andrews (George H.) Engineering Associates, Inc., Washington, D.C.

Descriptors: *Industrial plants, Material forming, *Brass, *Casting, Castings, Industrial equipment, Management engineering, Costs.

The purpose of this report is to present basic information for establishing a brass foundry in a foreign country to produce brass castings. While the information shown in this report is based on brass products, other materials such as copper, aluminum and nonferrous alloys may be cast. (Author)

PB-175 535 **PC A05 MF A01**
 International Cooperation Administration, Washington, D. C. Technical Aids Branch.
Executive's Role in an Organization.
 1957, 82p Rept no. Training Manual-110
 Prepared in cooperation with Industrial Development Center, Manila. Management Training Forum Services.

Descriptors: *Management engineering, *Supervisory personnel, Organizations, Management planning, Management control systems, Leadership, Job analysis, Instruction manuals.

Contents: Responsibilities of the executive; Company organization; Departmental organization; Planning; Directing; Coordinating; Controlling.

PB-175 537 **PC A08 MF A01**
 International Cooperation Administration, Washington, D. C. Technical Aids Branch.
Lumber Seasoning.

Edward C. Peck, and John M. McMillen. Jul 61, 165p
 Prepared in cooperation with Forest Products Lab.

Descriptors: *Wood, Aging(Materials), Deterioration, Shrinkage, Moisture, Drying, Manpower, Handling, Degradation, Heat, Insects, Air, Costs, Storage, Foundations(Structures), Structures, Tables, Safety.

The report deals with the seasoning of lumber, especially by comparatively simple means applicable throughout the entire world. Seasoning is important because the removal of moisture from green wood is generally necessary before the material can be safely stored or used to best advantage. For particular uses, drying to a low moisture content is required. While the main part of this report refers to methods and techniques of air drying and kiln drying lumber, such other phases are covered as basic properties of wood, principles of moisture

removal, protection of green wood from attack by fungi and insects, and dry lumber storage.

PB-175 538 **PC A03 MF A01**
 International Cooperation Administration, Washington, D. C. Technical Aids Branch.
Plant Requirements for Manufacture of Nylon Hosiery.
 Oct 61, 33p
 Prepared in cooperation with Textile Associates, Inc., Boston, Mass.

Descriptors: *Industrial production, *Socks, Management engineering, Manufacturing methods, Industrial plants, Site selection, Buildings, Power supplies, Fuels, Industrial equipment, Labor, Personnel, Costs, Money, Budgets, Safety, Training, Commerce, Law, Machines, Management planning, Nylon, Management control systems.
 Identifiers: Nylon hosiery.

The purpose of this report is to present basic information for establishing a plant in a foreign country to produce women's full fashioned nylon hose from purchased nylon yarn. (Author)

PB-175 539 **PC A03 MF A01**
 International Cooperation Administration, Washington, D. C. Technical Aids Branch.
Plant Requirements for Manufacture of Cotton Dresses.
 Revised ed.
 Apr 59, 40p
 Prepared in cooperation with Methods Engineering Council, Pittsburgh, Pa.

Descriptors: *Industrial production, *Clothing, Cotton textiles, Management engineering, Management control systems, Management planning, Manufacturing methods, Industrial plants, Site selection, Buildings, Power supplies, Industrial equipment, Fuels, Labor, Personnel, Costs, Money, Budgets, Safety, Training, Law, Machines, Commerce.

The cotton dress industry is described as one of the most competitive manufacturing businesses in the United States. For this reason, a great amount of effort has been applied to making the processes as efficient as possible. Despite rising costs of materials and labor, high productivity makes it possible to produce stylish, simple dresses that retail in the United States for three to four dollars. Most of these are produced in small and medium-sized factories such as the one described in this manual. (Author)

PB-175 541 **PC A03 MF A01**
 International Cooperation Administration, Washington, D. C. Technical Aids Branch.
Plant Requirements to Set Up and Operate a Job Machine Shop.
 May 61, 49p
 Prepared in cooperation with Methods Engineering Council, Pittsburgh, Pa.

Descriptors: *Industrial plants, *Machining, Industrial equipment, Industrial production, Management engineering, Maintenance, Costs, Machine shop practice.

The purpose of this report is to present basic information for establishing and operating a job machine shop in a foreign country. The report includes current costs of labor, machinery, equipment and supplies, as well as additional information relative to engineering, training, safety, markets, sales, financial, and economic factors.

PB-175 546 **PC A03 MF A01**
 International Cooperation Administration, Washington, D. C. Technical Aids Branch.
Plant Requirements for Manufacture of Paint and Varnish Brushes.
 May 69, 47p
 Prepared in cooperation with Wolf Management Engineering Company, Chicago, Ill.

Descriptors: *Paint applicators, *Industrial production, Manufacturing methods, Industrial equipment, Industrial plants, Costs.

The manual is designed to provide a general picture of the factors which must be considered in establishing and operating a small-scale factory of this type.

PB-175 548 **PC A04 MF A01**
 International Cooperation Administration, Washington, D. C. Technical Aids Branch.
Rough Sawing of Logs.
 Oct 56, 65p
 Prepared in cooperation with Wolf Management Engineering Co., Chicago, Ill.

Descriptors: *Wood, *Industries, Trees, Saws, Costs, Machine tools, Labor, Efficiency, Commerce, Industrial equipment, Management planning, Personnel, Structures, Power, Specifications, Maintenance, Terrain, Wastes(industrial).

The purpose of the report is to present basic information for establishing and operating a logging and sawmilling operation in any country where logging operations are considered feasible. The information includes general logging and sawmill methods, mill layout, machinery requirements, and the costs of materials, equipment, labor, and overhead expenses. (Author)

PB-175 549 **PC A03 MF A01**
 International Cooperation Administration, Washington, D. C. Office of Industrial Resources.
Hand-Made Blown Glass and Fine Cast Crystal.
 Technical inquiry service.
 Jan 60, 36p
 Prepared in cooperation with Aries Associates, Inc., Stamford, Conn.

Descriptors: *Glass, Material forming, Manufacturing methods, Castings, Furnaces, Industrial production, Industrial plants, Management engineering, Costs.

The manufacture of glass products of artistic merit requires highly skilled and experienced artisans, not only for the design and execution of the finished articles, but for the formulation and manufacture of batches of fine glass and crystal of desired working properties and attractive color and lustre. This report emphasizes the process of making the glass batch itself, the plant and equipment required, and general procedures of furnace work and annealing, rather than the skilled techniques of blowing, pressing, cutting or engraving required to produce and decorate the finished article. The operation of the proposed plant consists essentially in the manufacture of batches of various types of glass, largely for inventory, and the working up of glass into finished articles in a sequence of operations, many of which proceed more or less independently of the glass manufacturing operation. (Author)

PB-175 550 **PC A03 MF A01**
 International Cooperation Administration, Washington, D. C. Technical Aids Branch.
Wood Wastes.
 Technical inquiry service.
 Apr 58, 35p
 Prepared in cooperation with Wolf Management Engineering Co., Chicago, Ill.

Descriptors: *Wood, *Wastes(industrial), Particles, Costs, Specifications, Industrial production, Machine tools, Industrial equipment, Disposal, Manufacturing methods, Cleaning, Absorption, Curing agents, Abrasives, Packing materials, Storage, Management engineering.

Contents: Economic consideration; Uses of sawdust; Wood flour; (definition and description, history, uses, industry production, wood species used, raw material requirements, manufacturing methods, manufacturing systems, general comments on production equipment, protection of equipment, related business opportunities, selling prices, typical specifications, plant investment, production costs, operating statement and cost per ton).

PB-175 551 **PC A04 MF A01**
 International Cooperation Administration, Washington, D. C. Technical Aids Branch.

SELECTED APPROPRIATE TECHNOLOGIES

Human Relations in Management.
 Management primer.
 1962, 68p Rept no. Training manual-93
 Report on Principles and Practices of Productivity.

Descriptors: *Management engineering, *Instruction manuals, Training devices, Production control, Wages, Personnel management, Labor, Supervision, Money, Public relations, Psychology, Employee relations.

Contents: Human relations and organization; Improving human relations; Dealing with representatives of employee groups; Principles of supervision; Human relations and productivity. (Author)

PB-176 780 PC A04 MF A01
 National Swedish Inst. for Building Research, Stockholm (Sweden).

Building and Planning in Developing Countries: A Partially Annotated Bibliography.
 1967, 71p Rept no. 28:1967

Descriptors: *Construction, Bibliographies, *Housing, *Urban planning, Sweden, Reports, Climatology, Construction materials, Urban areas, Economics, Sociology, Africa, Asia, Central America, South America.

In recent years interest in the problems of the developing countries has been gathering momentum amongst Swedish technologists. The present bibliography is step aimed especially at helping architects interested in this field. It consists of 450 references to books, reports and articles, out of which 80 were commented upon. The references have been grouped under the following nine sub-headings: (1) Climate and its influences, (2) Building materials and construction techniques, (3) Building design, (4) Town-planning, (5) Urbanization, (6) Economics, (7) Sociology, (8) Housing, and (9) General.

PB-177 544 PC A11 MF A01
 Stanford Research Inst., Menlo Park, Calif.
Water, Mineral, and Forest Resources in Regional Economic Development.
 Robert K. Arnold, Ernest C. Harvey, Genie E. Willeke, and Joseph E. R. Carrier. Sep 66, 235p Contract C-300-66

Descriptors: *Natural resources, United States, Economics, Minerals, Forestry, Water, Organizations, Fiberboard, Atmospheric precipitation, Evaporation, Industries, Metals.
Identifiers: Area planning and development, Regional economic development.

Extensive literature and numerous programs exist concerning the development of forest, mineral, and particularly, water resources in specific areas of the United States. Comparatively little of this work is directed specifically to the relation between development of resources and regional growth, much less to the specific programs and policies of a regional organization whose objectives are to maximize regional economic development. It is the purpose of the report to provide some guide by indicating the relevant sections of the literature. This is essentially a task of interpretation. The growth of income and employment in regions of the United States may be explained in terms of the location and growth of basic industries and their cumulative effect on other industries. Analysis of the future growth potential of any region may be viewed as the study of the future growth of individual industries, the factors that influence their location, and the interrelations among various industries. (Author)

PB-177 908 PC A08 MF A01
 International Cooperation Administration, Washington, D. C. Office of Industrial Resources.
The Role of Small-Scale Manufacturing In Economic Development. The Experience of Industrially Advanced Nations as a Guide for Newly Developing Areas.
 Nov 57, 172p
 Prepared in cooperation with Stanford Research Inst., Menlo Park, Calif.

Descriptors: *Industries, *Economics, Production, Growth, Training, Factories, Agriculture, Fishes, Commerce, Mobilization, Switzerland, Transportation, Textiles, Australia, USSR, United States, Japan, Sweden, Management engineering.
Identifiers: Small businesses, Industrial management.

The manual is concerned with the appropriate structure of manufacturing in underindustrialized but developing countries. It is not concerned with the over-all process of economic growth. It assumes that some degree of industrialization will occur in underindustrialized societies and inquires only as to the proper balance between large-scale and small-scale manufacturing units. More specifically, it examines the proposition that economic growth may be retarded by overemphasis upon large-scale industrial operations. (Author)

PB-177 912 PC A03 MF A01
 International Cooperation Administration, Washington, D. C. Technical Aids Branch.

Improved Productivity In the Factory. A Jobbing Machine Shop.

Feb 58, 31p
 Prepared in cooperation with Methods Engineering Council, Pittsburgh, Pa., and Creative Arts Studio, Inc., Washington, D. C.

Descriptors: *Management planning, *Manufacturing methods, Human engineering, Design, Production, Maintenance, Machine tools, Machine shop practice, Safety, Quality control, Inventory control, Production control.

This brochure outlines some of the important factory conditions which lead to low efficiency. Its purpose is to show how step-by-step remedial action may be taken to correct these conditions, and improve productivity with no major expenditure for new machinery or equipment.

PB-177 915 PC A05 MF A01
 International Cooperation Administration, Washington, D. C. Technical Aids Branch.

Men's Work Shirts. Capital Requirements, Techniques and Operations.

1961, 76p
 Prepared in cooperation with Wolf Management Engineering Co., Chicago, Ill. A Reference for use in Planning New Industrial Facilities.

Descriptors: *Clothing, *Industrial production, Costs, Industrial plants, Quality control, Management engineering, Standards, Manpower, Manufacturing methods, Employment, Production control, Industrial equipment.

The report is concerned with the inexpensive work shirt. Being a staple item of clothing and sold in great volume under highly competitive conditions, it must necessarily be produced efficiently, using the best methods and equipment, if the enterprise is to be successful. Fortunately, the processes are well defined and comparatively simple, and the machinery required is readily available at reasonable cost. The basic information and factual data required for consideration before engaging in the business are presented. (Author)

PB-177 916 PC A13 MF A01
 International Cooperation Administration, Washington, D. C.

Papermaking and Manufacture of Paper Products as a Small-Scale, Semi-Mechanized and Cottage Industry. Materials—Processes—Equipment Organization—Economics—marketing.

J. Ben Lieberman. Jun 58, 291p
 Prepared in cooperation with Stanford Research Inst., Menlo Park, Calif.

Descriptors: *Paper industry, *Economics, Paper, Manufacturing methods, Feasibility studies, Site selection, Industrial training, Natural resources, Organic materials, Materials, Agriculture, Test methods, Analysis, Sociology, China, Japan.

This Manual is designed to provide a general picture of the factors which must be considered in establishing and operating a small-scale papermaking industry. It should prove useful in creating inter-

est in the subject, and serve to give enough understanding of the related considerations to help government officials, other leaders and entrepreneurs determine whether the potential deserves more-detailed attention. Also, special segments of the Manual may serve as separate manuals or references for specific phases of the subject.

PB-177 918 PC A03 MF A01
 International Cooperation Administration, Washington, D. C. Technical Aids Branch.

Plant Requirements for Manufacture of Buckets, Pails and Pans.

Revised ed.
 May 59, 38p

Prepared in cooperation with Andrews (George H.) Engineering Associates, Inc., Washington, D. C.

Descriptors: *Containers, Industrial production, Kitchen equipment + supplies, Manufacturing methods, Industrial plants, Costs, Zinc coatings, Corrosion inhibition, Tin coatings, Costs, Labor, Industrial equipment, Personnel, Training.

Galvanizing is a process by which iron or steel is coated with zinc to render it rust-resistant. There are three general methods for accomplishing this. They are, (1) the hot - dip method; (2) the electro-galvanizing method; and (3) the Sherardizing method. This manual describes the hot-dip method because it is the most widely used and because of its economic advantages over the other methods. The tinplating process is accomplished by the same basic method. The galvanizing process is used in the manufacture of buckets, pails, wash tubs, water tanks and many industrial products. It cannot be used in any product which comes in contact with food, however, because the zinc will contaminate the food. Tinplated products, on the other hand, are used extensively for food containers. There is very little tinplating done by the hot-dip method in the United States due to the high cost of tin. In fact, many manufacturers are using aluminum, stainless steel, and copper for cooking utensils instead of tinplate. In other parts of the world, however, tin would probably be cheaper than other applicable materials. (Author)

PB-177 919 PC A03 MF A01
 International Cooperation Administration, Washington, D. C. Technical Aids Branch.

Plant Requirements for Manufacture of Ceramic Dinnerware.

Revised ed.
 May 59, 41p

Prepared in cooperation with Andrews (George H.) Engineering Associates, Inc., Washington, D. C.

Descriptors: *Kitchen equipment + supplies, Industrial production, Ceramic materials, Industrial plants, Industrial equipment, Manufacturing methods, Costs, Labor, Commerce, Standards, Personnel, Training, Safety.
Identifiers: Dinnerware.

Dinnerware production in the United States ranges from very high production from highly mechanized factories to very small potteries which produce in small quantities. The smaller potteries generally depend on the unusual in design in marketing their ware, while the larger potteries rely heavily on competitive pricing. The products of the plant discussed in this report are those comprising a line of relatively heavy, serviceable, semi-vitreous dinnerware. A representative assortment of products consists of cups, saucers, 6-inch and 10-inch plates, salad bowls, and large serving bowls. (Author)

PB-177 921 PC A03 MF A01
 International Cooperation Administration, Washington, D. C. Technical Aids Branch.

Plant Requirements for Manufacture of Men's Socks.

Revised ed.
 May 59, 33p

Prepared in cooperation with Andrews (George H.) Engineering Associates, Inc., Washington, D. C.

Descriptors: *Socks, *Industrial production, Industrial plants, Costs, Labor, Industrial equipment,

SELECTED APPROPRIATE TECHNOLOGIES

Dyes, Budgets, Manufacturing methods, Training, Personnel:

The purpose of this manual is to present basic information for establishing and operating a small plant for the manufacture of men's socks. Except for a small percentage all socks are made by the knitting process. There are about 4,000 knitting industries in the United States. A few of the products made in these industries include outerwear, underwear and hosiery. However, this manual will be devoted exclusively to men's socks. The term sock used in this manual denotes a short stocking as distinguished from a hose that is longer. (Author)

PB-177 923 PC A03 MF A01
International Cooperation Administration, Washington, D. C. Technical Aids Branch.

Plant Requirements for Manufacture of Sanitary Ware.

Revised ed.

May 59, 39p

Prepared in cooperation with Andrews (George H.) Associates, Inc., Washington, D. C.

Descriptors: *Toilet facilities, *Industrial production, Ceramic coatings, Industrial equipment, Industrial plants, Manufacturing methods, Iron, Castings, Costs, Labor, Standards.

The process of enameling cast iron sanitary ware imparts a hard, glossy surface to the object. This coating permits easy cleaning and presents a pleasing appearance. It is stain resistant, highly acid resistant, and, if properly applied and given reasonable care in usage, will last almost indefinitely. The type of plant described in this report is one which could be set up in almost any part of the world. The basic raw materials -- pig iron, scrap iron, and sand -- are ordinarily obtainable in all parts of the world. Where special skills would be required for the production of the ware, modern machinery has been substituted wherever feasible. In this way, the operation can be started more readily and quality standards can be reached sooner. (Author)

PB-177 924 PC E99 MF A01
International Cooperation Administration, Washington, D. C. Technical Aids Branch.

Plant Requirements for Manufacture of Terry Cloth.

Revised ed.

May 59, 37

Prepared in cooperation with Andrews (George H.) Associates, Inc., Washington, D. C.

Descriptors: *Textiles, *Industrial production, Labor, Costs, Industrial equipment, Industrial plants, Manufacturing methods, Cotton.

Identifiers: *Terry cloth.

Terry cloth is cotton fabric covered with loops on one or both sides. It requires two sets of warps and one set of filling; one set of warp threads is held taut while weaving, the other set is released to form the loops. When woven in linen (rare) or bleached cotton in narrow widths, terry cloth is called 'Turkish toweling.' This usually has two loops (called double-loop terry). It can also be made in checks, stripes, or plaid, or bleached and dyed. Uses include towels, wash cloths, robes, bath mats, bathing suits or sunsuits, linings for suits and coats, draperies, spreads, bedrolls, and potholders. Terry cloth readily absorbs and retains moisture, making it suitable for use as wash cloths and toweling. It is used in some applications because of its efficiency as an insulating medium and because it is readily washed when soiled. Due to the fact that the applications of single-loop terry cloth are numerous and in good volume, the discussion is concerned with the production of cloth of that type in a mill of minimum economic size. (Author)

PB-177 925 PC A03 MF A01
International Cooperation Administration, Washington, D. C. Technical Aids Branch.

Plant Requirements for Manufacture of Wood Tables and Chairs.

Revised ed.

May 59, 46p

Prepared in cooperation with Andrews (George H.) Associates, Inc., Washington, D. C.

Descriptors: *Kitchen equipment + supplies, *Industrial production, Wood, Manufacturing methods, Industrial plants, Industrial equipment, Costs, Labor.

Identifiers: Tables and chairs.

The purpose of this manual is to provide information for the establishment and operation of a small plant to manufacture low cost wooden tables and chairs. The table and chairs shown in this manual are designed for low cost production and are not intended for the luxury market. Local customs might require some change in the designs. However, design changes that will add substantially to the cost of the product should be avoided. (Author)

PB-177 926 PC A04 MF A01
International Cooperation Administration, Washington, D. C. Technical Aids Branch.

Plant Requirements to Set Up and Operate a Meat Processing Plant.

Revised ed.

May 59, 54p

Prepared in cooperation with Andrews (George H.) Engineering Associates, Inc., Washington, D. C.

Descriptors: *Meat, Processing, Industrial plants, Industrial equipment, Personnel, Production control, Labor, Costs.

The purpose of this manual is to provide information about the establishment and operation of a small meat processing plant. The manual provides a description of the slaughtering and of the processing of meat products as these activities might be carried out in a small plant in United states. It includes a description of the plant layout, equipment and personnel and estimates of investment, operating costs and revenues. Local situations might make some changes desirable but the plant described is satisfactory for a considerable variation in materials and methods of processing and product without serious modification of the design and operation. (Author)

PB-177 927 PC A03 MF A01
International Cooperation Administration, Washington, D. C.

Plant Requirements for Manufacture of Worsted Yarns.

Sep 61, 35p

Prepared in cooperation with Andrews (George H.) Engineering Associates, Inc., Washington, D. C.

Descriptors: *Fibers, Industrial production, Manufacturing methods, Industrial plants, Industrial equipment, Costs, Labor, Training.

No abstract available.

PB-177 928 PC A03 MF A01
International Cooperation Administration, Washington, D. C. Technical Aids Branch.

Plant Requirements to Set Up and Operate a Dry Cleaning Plant.

Sep 57, 47p

Prepared in cooperation with Andrews (George H.) Engineering Associates, Inc., Washington, D. C.

Descriptors: *Industrial plants, *Cleaning, Textiles, Cleaning compounds, Solvents, Industrial equipment, Costs, Driers(Apparatus), Presses(Machinery), Packaging, Safety.

Identifiers: Dry cleaning.

The small dry cleaning plant described in this brochure is intended to clean and finish all types of clothing, bedding, draperies and many other kinds of household textile articles. Dry cleaning textile articles generally is done by washing them in petroleum solvent, such as benzine, or in synthetic solvent, such as perchlorethylene. The equipment for one of these processes cannot be used for the other process. The dry cleaning process carried out in a synthetic-solvent plant using perchlorethylene is described in this brochure. (Author)

PB-177 929 PC A03 MF A01
International Cooperation Administration, Washington, D. C. Technical Aids Branch.

Plant Requirements for Manufacture of Flush Doors.

Sep 67, 34p

Prepared in cooperation with Andrews (George H.) Engineering Associates, Inc., Washington, D. C.

Descriptors: *Doors, *Industrial production, Wood, Manufacturing methods, Industrial plants, Industrial equipment, Specifications, Labor, Costs.

The equipment and operating procedures described in this brochure are intended for the production of flush doors as an addition to, or the expansion of, an existing woodworking plant, where there is sufficient demand for these products and where such a local operation would be practicable. The equipment and methods shown in this brochure are modern and capable of making all grades of flush doors, both interior and exterior, up to 3 feet wide and 7 feet long. (Author)

PB-177 930 PC A03 MF A01
International Cooperation Administration, Washington, D. C. Technical Aids Branch.

Plant Requirements for Manufacture of Plywood.

Sep 57, 45p

Prepared in cooperation with Andrews (George H.) Engineering Associates, Inc., Washington, D. C.

Descriptors: *Plywood, *Industrial production, Manufacturing methods, Industrial plants, Industrial equipment, Storage, Handling, Wood, Processing, Labor, Costs.

The small plywood plant described in this brochure is intended to manufacture plywood panels in a foreign country, where there is sufficient demand for these products and where such a local operation would be practicable. The machinery, equipment and methods shown in this brochure are modern and capable of making all grades of veneer and plywood, including marine plywood. The plant will operate equally well with either hard or soft wood. (Author)

PB-177 931 PC A02 MF A01
International Cooperation Administration, Washington, D. C. Technical Aids Branch.

Plant Requirements for Manufacture of Porcelain Enamelware.

Apr 56, 20p

Prepared in cooperation with Penniman and Browne, Baltimore, Md.

Descriptors: *Kitchen equipment + supplies, *Industrial production, Cooking devices, Manufacturing methods, Processing, Industrial equipment, Industrial plants, Costs.

Contents: Manufacturing operations; Plant requirements; Suggested sources of supply for raw materials and processing equipment; Illustration; Supplementary data; Sources of information.

PB-177 932 PC A03 MF A01
International Cooperation Administration, Washington, D. C. Technical Aids Branch.

Plant Requirements for Manufacture of Asbestos - Cement Pipe.

Jun 60, 33p

Prepared in cooperation with Andrews (George H.) Engineering Associates, Inc., Washington, D. C.

Descriptors: *Pipes, *Industrial production, Asbestos, Cements, Manufacturing methods, Industrial plants, Industrial equipment, Costs, Labor.

As indicated by the name, asbestos-cement pipe is made of asbestos fibre and Portland cement, usually in combination with some other material like silica. A curing agent may also be added but this is not always necessary. In the United States the market for asbestos-cement pipe is large and growing steadily. This favorable situation has grown from the fact that these products meet many of the needs for pipe with the physical characteristics of asbestos-cement products. They are inexpensive and with unusual resistance to various

SELECTED APPROPRIATE TECHNOLOGIES

corrosive fluids found in many pipe systems. Asbestos does not burn and is a very poor conductor of electricity. (Author)

PB-177 933 PC A04 MF A01
International Cooperation Administration, Washington, D. C. Technical Aids Branch.

Plant Requirements for Manufacture of Soybean Oil and Meal.

Sep 61, 62p
Prepared in cooperation with Andrews (George H.) Engineering Associates, Inc., Washington, D. C.

Descriptors: *Vegetable oils, Processing, Industrial plants, Industrial equipment, Phospholipids, Food, Glycerols, Acids, Yeasts, Colloids, Paints, Insecticides, Purification, Labor, Costs.
Identifiers: Soybeans.

Soya beans, which are native to eastern Asia, are now grown extensively in all parts of the world. They thrive best in the temperate zone. The uses for the end product are many, at latest count numbering some 150 separate applications. The principal uses of the expelled crude soya oil include seven basic categories: (1) Technical refined oils; (2) Edible refined oils; (3) Edible lecithin; (4) Technical lecithin; (5) Medicinal lecithin; (6) Glycerine; (7) Acids. (Author)

PB-177 934 PC A03 MF A01
International Cooperation Administration, Washington, D. C. Technical Aids Branch.

Plant Requirements for Manufacture of Chalk Whiting.

Sep 61, 36p
Prepared in cooperation with Andrews (George H.) Engineering Associates, Inc., Washington, D. C.

Descriptors: *Mineral products, *Industrial production, Limestone, Material separation, Particle size, Manufacturing methods, Industrial plants, Industrial equipment, Labor, Costs.
Identifiers: Chalk whiting.

The report is primarily concerned with the absolute minimum operation for manufacture of true chalk whiting and, therefore, discusses the simplest manufacturing processes utilizing the crushing, grinding, and screening of high purity chalk. However, sources of raw material for the manufacture of true whiting are limited. This, and many other factors have led to the development of whiting substitutes with their alternate methods of manufacture and production. The CaCO₃ chemical industry that has grown up in the United States in recent years is an outstanding example of such a development. Before presenting the detailed description of the manufacture of true chalk whiting, sufficient information on whiting substitutes is included to present a basic concept of methods for their production and to offer to present a basic concept of methods for their production and to offer sources of information for further study of operations that may be adaptable to any locale and its available raw materials. (Author)

PB-177 935 PC A03 MF A01
International Cooperation Administration, Washington, D. C. Technical Aids Branch.

Plant Requirements for Manufacture of Stretch Socks for Men and Children.

Sep 61, 34p
Prepared in cooperation with Andrews (George H.) Associates, Inc., Washington, D. C.

Descriptors: *Socks, *Industrial production, Manufacturing methods, Textile industry, Industrial plants, Industrial equipment, Dyes, Labor, Costs.

The purpose of this report is to present basic information for establishing a manufacturing plant in a foreign country to produce stretch socks for men and children. Such a manufacturing plant is generally known as a knitting mill. (Author)

PB-177 943 PC A03 MF A01
International Cooperation Administration, Washington, D. C. Office of Industrial Resources.

mayonnaise.

Technical inquiry service.

1 May 59, 29p
Prepared in cooperation with Snell (Foster D.) Inc., New York.

Descriptors: *Food, Processing, Colloids, Costs, Production, Industrial equipment, Industrial plants, Packaging, Sanitary engineering.
Identifiers: Mayonnaise.

The report covers the procedures, plant equipment, and economics involved in the manufacture of 250,000 pounds of mayonnaise per year. Two manufacturing procedures are covered: (1) Batch mixing or beating; (2) Continuous emulsification or homogenization. Economics of operation for each process are shown for investment comparisons, and include lists of equipment required, labor, utility, and material balances. Formulas for several types of commercial mayonnaise are given. (Author)

PB-177 944 PC A03 MF A01
International Cooperation Administration, Washington, D. C. Office of Industrial Resources.

A Small Particle Board Plant.

Technical inquiry service.

Jun 59, 35p
Prepared in cooperation with Andrew (George H.) Engineering Associates, Inc., Washington, D. C.

Descriptors: *Panels(Structural), *Industrial production, Manufacturing methods, Industrial plants, Industrial equipment, Production control, Labor, Costs.
Identifiers: Particle board.

The purpose of this report is to present basic information for establishing and operating a small particle board plant in a foreign country. The plant is designed to produce about 120 boards per hour. Based on current practice in the United States, this is a small plant. The recommended equipment and production methods are modern and have proven profitable when operating under conditions comparable to those assumed. (Author)

PB-177 945 PC A03 MF A01
International Cooperation Administration, Washington, D. C. Office of Industrial Resources.

Aluminum Door and Window Sash.

Technical inquiry service.

Nov 59, 46p
Prepared in cooperation with Lederer (A. M.) and Co., Inc., New York.

Descriptors: *Structural parts, Aluminum, Costs, Manpower, Extrusion, Assembling, Site selection, Manufacturing methods, Industrial equipment, Doors, Industrial production, Buildings, Industrial plants, Inventory control, Training, Safety.
Identifiers: Sashes(Structural), Windows.

Aluminum is used in place of or along with wood and other forms of building materials in the manufacture of window and door sash in residential, commercial, and manufacturing structures. Aluminum sash doors and windows are generally made of extruded aluminum sections, glass, aluminum mesh screens, neoprene vinyl, and stainless steel. A wide variety of designs and sizes is manufactured depending upon the use to which the units are to be put. (Author)

PB-177 946 PC A03 MF A01
International Cooperation Administration, Washington, D. C. Office of Industrial Resources.

Silk Screen Printing on Textiles.

Technical inquiry service.

Jul 60, 41p
Prepared in cooperation with Mayer (Frank) Engineering Co., Los Angeles, Calif.

Descriptors: *Textiles, *Printing, Fibers(Natural), Fibers(Synthetic), Dyes, Costs, Labor, Industrial equipment, Colors, Industrial plants.

Silk screen printing varies in complexity from a simple operation to a highly scientific art. If confined to the use of pigmented dyes, a satisfactory product can be produced for cottage industry with a minimum of equipment and without the need of highly trained and skilled color chemists and spe-

cial equipment for dye setting and aging. It is basically a service industry since no product is produced; instead printing is done to supply the needs of other manufacturers for decoration of their products. One thousand to twelve hundred yards of material can be printed on five tables by six people in one eight-hour shift. (Author)

PB-177 948 PC A05 MF A01
International Cooperation Administration, Washington, D. C. Office of Industrial Resources.

Lubrication Fundamentals and Practices. Sessions I, II, and III.

Apr 57, 91p Rept no. Technical Bull-43
Prepared in cooperation with Armstrong Cork Co., Lancaster, Pa. See also Session 4, 5, 6 and 7, PB-177 949.

Descriptors: *Lubrication, Instruction manuals, Greases, Oils, Protection, Bearings, Viscosity, Friction, Specifications, Gears, Industrial equipment, Handling, Storage.

Contents: Principles of lubrication; Characteristics of lubricants; Methods of applying lubricants; Gears and their lubrication; General bearings, electric motors and their lubrication; Lubrication of plant equipment; and Lubrication department operation.

PB-177 949 PC A07 MF A01
International Cooperation Administration, Washington, D. C. Office of Industrial Resources.

Lubrication Fundamentals and Practices. Sessions IV, V, VI and VII.

Apr 57, 137p Rept no. Technical Bull-44
See also Sessions 1, 2, and 3, PB-177 948. Prepared in cooperation with Armstrong Cork Co., Lancaster, Pa.

Descriptors: *Lubrication, Instruction manuals, Gears, Bearings, Electric motors, Friction, Industrial equipment, Lubricants, Handling, Storage.

Contents: Gears and their lubrication; Lubrication of general bearings and electric motors; Lubrication of plants equipment; Lubrication department operation.

PB-177 955 PC A05 MF A01
International Cooperation Administration, Washington, D. C. Office of Industrial Resources.

Department Store Merchandising.

1961, 79p Rept no. Technical Bull-63

Descriptors: *Management engineering, Instruction manuals, Money, Costs, Organizations, Operation, Commerce, Personnel management, Management planning.
Identifiers: Merchandising.

The manual provides eight sessions on the subject of Retail Merchandising or Store Management. The training course in 'Retail Merchandising' is directed to the specific purpose of training people in the best methods and procedures in the conduct of a small retail or department store. The material for the conduct of this course is, more or less, in outline form.

PB-177 956 PC A04 MF A01
International Cooperation Administration, Washington, D. C. Office of Industrial Resources.

Retail Selling.

George H. Andrews. 1961, 73p Rept no.

Technical Bull-65

Prepared in cooperation with Engineering Associates, Inc., Washington, D. C.

Descriptors: *Management engineering, Instruction manuals, Costs, Money, Training, Personnel management, Commerce, Management planning.

The manual provides nine sessions on the subject of 'Retail Selling.' The training course in 'Retail Selling' is directed to the specific purpose of training people in the best methods and procedures in the conduct of a small retail store.

SELECTED APPROPRIATE TECHNOLOGIES

PB-177 962	PC A04 MF A01	No abstract available.	Contents: Skin structure; Protein chemistry and soaking; Liming; Unhairing; Conditioning effects in liming; Enzymes, bacteria and bathing; Bathing; Pickling; Quantitative analysis; Hydrolysis equilibria; PH and oxidation reduction; Decreasing; Chromium - The werner co-ordination theory; Chrome complexes and colation; Chrome liquors; Two-bath process and neutralization; Chrome tanning theories - emulsions; Fatiouquing - stuffing and emulsions; Emulsion theories; Surface chemistry; Dyeing and coloring; Protective and decorative coatings.
Management Primer. Principles and Practices of Productivity. Personnel Administration. 1962, 73p Rept no. Training manual-94	International Cooperation Administration, Washington, D. C. Technical Aids Branch.		
Descriptors: *Management engineering, Instruction manuals, *Personnel management, Instruction manuals, Employment, Job analysis, Wages, Employee relations, Motivation, Organizations, Personnel, Training, Records.			
Contents: Selection and Hiring of Employees; Compensation of Employees and Job Rating; Employee Training; Training of Supervisors; Employee Relations; Personnel Records.			
PB-177 963	PC A04 MF A01		
Management Primer. Principles and Practices of Productivity. Controls and Supervision. 1962, 62p Rept no. Training manual-95	International Cooperation Administration, Washington, D. C. Technical Aids Branch.		
Descriptors: *Management engineering, Instruction manuals, *Supervision, *Management control systems, Personnel management, Quality control, Records, Money, Supervisory personnel, Training, Production control, Inventory control, Costs.			
Contents: Planning for control; Setting up control procedure; Controls as money savers; The supervisor and supervision; The supervisor as an organ of control; Visual controls in supervision.			
PB-177 964	PC A04 MF A01		
Management Primer. Principles and Practices of Productivity. Procurement and Inventory. 1962, 59p Rept no. Training manual-98	International Cooperation Administration, Washington, D. C. Technical Aids Branch.		
Descriptors: *Management engineering, Instruction manuals, *Inventory control, Management planning, Management control systems, Procurement, Costs, Organizations, Inventory, Contracts, Stock level control, Storage, Quality control, Budgets.			
Contents: Five principles of good procurement; The practice of procurement; Sound procurement policy; Centralized procurement; Organization for procurement; The procurement contract; The question: Make or buy; Procurement and inventory; The role of inventory in an enterprise; The problems of inventory management; The aims of inventory management; The administration of inventory; Budgeting for inventory; The role of receiving in inventory management; The management of storage.			
PB-177 965	PC A04 MF A01		
Management Primer. Principles and Practices of Productivity. Distribution and Sales. 1962, 70p Rept no. Training manual-100	International Cooperation Administration, Washington, D. C. Technical Aids Branch.		
Descriptors: *Management engineering, Instruction manuals, Commerce, Consumption, Distribution(Economics), Costs, Management planning, Production.			
Contents: The place of sales in business management; The consumer and competition; Market research and sales forecasting; Merchandising; Pricing policy; Service; Advertising; and Sales management.			
PB-177 966	PC A05 MF A01		
Management Primer. Principles and Practices of Productivity. Research and Public Relations. 1962, 95p Rept no. Training manual-101	International Cooperation Administration, Washington, D. C. Technical Aids Branch.		
Descriptors: *Management engineering, Instruction manuals, Commerce, Public relations, Production, Problem solving, Industrial psychology.			
PB-177 967	PC A04 MF A01		
Sales Promotion Methods. George H. Andrews. 1962, 66p Rept no. Training Manual-103	International Cooperation Administration, Washington, D. C. Technical Aids Branch.		
Prepared in cooperation with Andrews Engineering Associates, Inc., Washington, D. C.			
Descriptors: *Management engineering, *Commerce, Catalogs, Display systems, Public relations, Management planning, Professional personnel, Instruction manuals. Identifiers: Sales promotion, Salesmen.			
Contents: What is sales promotion; The scope of sales promotion; A salesman's tools; Window and interior displays; Direct mail advertising; Catalogs and price lists; Advertising specialties, premiums, and contents; and Coordination - key to successful sales promotion.			
PB-177 971	PC A05 MF A01		
Marketing Research. 1962, 85p Rept no. Training manual-117	International Cooperation Administration, Washington, D. C. Technical Aids Branch.		
Prepared in cooperation with Andrews (G. H.) Engineering Associates, Inc., Washington, D. C.			
Descriptors: *Commerce, Training, Analysis, Scientific research, Economics, Research program administration, Instruction manuals. Identifiers: *Marketing research.			
Contents: Basis of marketing research; Types of marketing research; Basic procedures and methods of marketing research; Situation analysis and informal investigation; Planning and preparing for the final research; Collection, tabulation, and analysis of data; Interpretation and presentation of data follow-up; General review - case studies.			
PB-177 972	PC A06 MF A01		
Leather Chemistry for Foremen. First Year Course. 1962, 121p Rept no. Training Manual-119	Agency for International Development, Washington, D. C. Communications Resources Div.		
Prepared in cooperation with Lawrence (A. C.) Leather Co., Peabody, Mass., and Lowell Technological Institute, Mass.			
Descriptors: *Leather, Chemical engineering, Atoms, Molecules, Symbols, Chemical reactions, Metals, Solutions, Ionization, Atomic structure, Hydrocarbons, Methane, Alcohols, Aldehydes, Ketones, Acids, Esters, Fatty acids, Waxes, Amines, Carbohydrates, Aromatic compounds, Halogen compounds, Dyes, Processing, Molecular structure.			
Contents: Atoms and molecules; Symbols and formulas; Some non-metallic elements; Chemical reactions; Chemical arithmetic; Metals; Solutions; Ionization; Atomic structure; Introduction - structural theory; Hydrocarbons and methane series; Alcohols; Aldehydes, ketones, acids, esters; Fats, oils and waxes; Amines; Carbohydrates; Aromatic amines; Halogen compounds; and Dyes and dyeing.			
PB-177 973	PC A06 MF A01		
Leather Chemistry for Foremen. Second Year Course. Albert E. Chouinard. 1962, 121p Rept no. Training Manual-120	Agency for International Development, Washington, D. C. Communications Resources Div.		
Prepared in cooperation with Lowell Technological Institute, Mass., and Lawrence (A. C.) Leather Co., Peabody, Mass.			
Descriptors: *Leather, Chemical engineering, Hair, Skin, Proteins, Enzymes, Bacteria, Pickling, Quantitative analysis, Hydrolysis, PH, Oxidation-reduction reactions, Chromium, Tanning, Dyes, Coatings, Neutralization, Colloids.			
PB-177 974	PC A04 MF A01		
Leather Chemistry for Foremen. Third Year Course. Albert E. Chouinard. 1962, 53p Rept no. Training Manual-121	Agency for International Development, Washington, D. C. Communications Resources Div.		
Prepared in cooperation with Lawrence (A. C.) Leather Co., Peabody, Mass., and Lowell Technological Inst., Mass.			
Descriptors: *Leather, Chemical engineering, Instruction manuals, Solutions, Standards, Volumetric analysis, Chemical indicators, Chromates, Tanning, Histology, Histological techniques, Dyes, Colors, Finishes + finishing, Processing.			
Contents: Weighing - Measuring - standard solutions; Standard solutions; pH measurements and indicators; Volumetric analysis; Water analysis; Determination of hide substance; Determination of chromic oxide in leather; Analysis of leather; Analysis of vegetable tanning materials; Histology - the study of tissues, the microscope, the technique of slide making, special tests in leather microscopy; Beam house operations; Tanning; Retanning; Dyeing and fatliquoring; Formulation of three brown colors; Finishing.			
PB-177 981	PC A05 MF A01		
Leather Technology. 1962, 86p Rept no. Training Manual-140	Agency for International Development, Washington, D. C. Communications Resources Div.		
Descriptors: *Leather, Processing, Instruction manuals, Tanning, Dyes, Lubrication, Skin, Curing agents, Colors, Costs.			
Contents: Introduction; Hides and skins; Soaking and unhairing; Liming, beaming and splitting; Acids and alkalies and the pH system of measuring their strength; Tanning; Vegetable tanning; Leather lubrication; Drying and pasting; Dyes and coloring; Economics in the leather industry; Workshop on upper leather; Leather machinery terms.			
PB-178 062	PC A03 MF A01		
Plant Requirements for Manufacture of Pharmaceutical Products. Sep 61, 50p	International Cooperation Administration, Washington, D. C. Technical Aids Branch.		
Descriptors: *Management planning, *Pharmacology, *Manufacturing methods, *Instruction manuals, Budgets, Safety, Costs, Money, Personnel, Training, Law, Site selection, Production, Manpower, Economics, Machines.			
The purpose of this report is to present basic information for establishing a plant in a foreign country to produce pharmaceutical products. The term pharmaceutical products includes tablets; pills, coated and uncoated; and capsules. (Author)			
PB-178 063	PC A05 MF A01		
Training Course in Marketing. Mar 60, 97p Rept no. Technical Bull-61	International Cooperation Administration, Washington, D. C. Office of Industrial Resources.		
Descriptors: *Management planning, *Instruction manuals, *Commerce, Training, Time, Distribution, Storage, Handling, Training, Money. Identifiers: Advertising.			

SELECTED APPROPRIATE TECHNOLOGIES

Contents: Introduction - important parts of marketing; Marketing research; Pricing policies; Advertising; Channels of distribution; Selling; Storage and warehousing; and Payment.

PB-178 064 **PC A04 MF A01**
 International Cooperation Administration, Washington, D. C. Technical Aids Branch.
Management Primer: Principles and Practices of Productivity - Records and Reports.
 May 62, 53p Rept no. Training manual-96

Descriptors: *Management planning, Reports, *Instruction manuals, Reports, Public opinion, Accuracy, Standardization, Classification, Manpower, Law, Records, Handling, Production, Costs, Money.
Identifiers: Accounting.

Written records are the memory of management. They preserve facts and figures by setting them down in writing for future use. Without records and the experience they preserve there would be no scientific management today. Recorded experience helps management in the planning and scheduling of its operations. By comparing recorded performance with planned performance supervisors can control the progress of enterprise activities. And, by using records to obtain detailed information on all enterprise developments, businessmen can base their decisions on experience and thus reduce the risks of misjudging enterprise strength. Records also protect management against legal difficulties, because they create and preserve evidence on internal and external transactions that may be questioned by the public, by government, by the courts, or by other enterprises. (Author)

PB-178 341T **PC A02 MF A01**
 National Tillage Machinery Lab., Auburn, Ala.
Investigation of Active Working Tools of Subsoil Irrigation Machines.
 V. P. Chalyi, and V. S. Burd. 28 Apr 68, 4p
 Trans. of Traktory i Selkhozmashiny (USSR) n9 p30-1 1966, by William R. Gill.

Descriptors: *Earth-handling equipment, Agriculture, *Irrigation systems, *Agriculture, Rural areas, USSR, Water, Soil mechanics, Tractors.
Identifiers: Graphs(Charts), Translations.

Subsoil irrigation differs from the conventional method of irrigation in that water, together with fertilizers and chemicals, is introduced directly in the subsoil horizon with the help of a special tool. The working tool forms a fluctuating shaped mole cavity at a depth of 20-35 cm. Great depth of covering water by the accepted line of machines (4-6 rows) and the loosening of the compact subsoil horizon creates difficulty in matching subsoil irrigation machines with the manufactured lines of cultivator tractors because of inadequate tractive power. Therefore decreasing the tractive resistance of the working tool is a real problem. Proceeding from this it is expedient to use active working tools in subsoil irrigation machines. (Author)

PB-178 345T **PC A02 MF A01**
 National Tillage Machinery Lab., Auburn, Ala.
Effect of Operational Speed on Forces Acting on Wedges.
 M. D. Podskrebko. 29 Jan 68, 7p
 Trans. of Vestnik Selskohzoistvennoi Nauki (USSR) n2 p98-101 1967, by William R. Gill.

Descriptors: *Earth-handling equipment, *Agriculture, Rural areas, USSR, Mathematical analysis, Soil mechanics, Tables, Stresses, Pressure, Friction, Bibliographies, Wedges.
Identifiers: Graphs(Charts), Translations.

The author describes results of the experimental study of the effect of speed of the motion of wedges in soil medium on the soil resistance forces which affect the operational surface in the zone of the initial crushing of soil. (Author)

PB-178 347T **PC A03 MF A01**
 National Tillage Machinery Lab., Auburn, Ala.

The Problem of Basic Parameters of Tillage Tools for Primary Soil Tillage, Chapter II.

A. T. Vaginym. 10 Mar 68, 45p
 Trans. of mono. Voprosy Selskohzoistvennoi Mekhaniki, Minsk, 1967 p57-98, by William R. Gill.

Descriptors: *Earth handling equipment, *Agriculture, Rural areas, Tractors, USSR, Mathematical analysis, Shear stresses, Soil mechanics, Tables.
Identifiers: Plowshares, Graphs(Charts), Translation.

There are six basic systems interactions of the operating tools of plowshare type plows with the soil: The action of one body alone without supplementary working tools; The operation of the basic body in conjunction with a skim coulter; The operation of the basic body with stationary jointer stripping the upper field corner of the slice; The operation of the basic body with supplementary working tools decreasing the bottom furrow angle; Two-level plowing; and Three-level plowing. (Author)

PB-178 373T **PC A02 MF A01**
 National Tillage Machinery Lab., Auburn, Ala.
Determination of the Optimum Parameters of Rotary Tiller Cultivation Equipment.
 V. S. Surilov. 3 May 68, 13p
 Trans. of Vsesoyuznyi Nauchno-Issledovatel'skii Institut Mekhanizatsii Sel'skogo Khozyaistva, Moscow. Sibirskii Filial. Nauchnye Trudy (USSR) n3 p185-94 1966, by William R. Gill.

Descriptors: *Earth-handling equipment, *Agriculture, Rural areas, Costs, Cost effectiveness, Economics, Tractors, Mathematical analysis, USSR, Soil mechanics.
Identifiers: Graphs(Charts), Rotary tillers, Translations.

The effectiveness of agricultural machines and tools depends on the extent their parameters suitably characterize the technological process of the worked media and the conditions of employment of a given machine. The basic parameters of rotary tiller row crop cultivators are: the width of cut B, forward speed V, and feed to the knife S. To supplement the parameters of the equipment we also take the mechanical efficiency and the coefficient of resistance to movement. The important qualities of the machine depend on the basic parameters of the equipment: the specific productivity, the specific cost, agrotechnical level of the treatment. (Author)

PB-179 304 **PC A05 MF A01**
 Hawaii Architects and Engineers, Inc., Honolulu.
Pre-Final Submission for Ebeye and Carlson, Marshall Islands: Trust Territory Physical Planning Program.
 Summary plan.
 12 Jan 68, 90p*
 See also PB-179 303.

Descriptors: *Urban planning, *Kwajalein Atoll, Urban areas, Rural areas, Transportation, Population, Social sciences, Budgets, Power, History.
Identifiers: Ebeye, Carlson, Land use.

Contents: Concept of the plan and its elements - Ebeye and Carlson (Transportation, Land use, Community facilities, Community appearance, Utilities, Budget cost proposals, Implementation); Existing conditions, trends, and opportunities; Historical and environmental influences.

PB-179 305 **PC A06 MF A01**
 Hawaii Architects and Engineers, Inc., Honolulu.
Pre-Final Submission for Saipan, Mariana Islands: Trust Territory Physical Planning Program.
 Summary plan.
 12 Jan 68, 113p*
 See also PB-179 304.

Descriptors: *Urban planning, *Micronesia, Urban areas, Rural areas, Transportation, Social sciences, Budgets, History, Power.
Identifiers: Saipan, Mariana Islands, Land use.

Contents: Concept of the plan and its elements (Transportation, Land use, Community facilities,

Community appearance, Utilities, Budget cost proposal, Implementation); Existing conditions, trends, and opportunities; Historical and environmental influences.

PB-179 327 **PC A08 MF A01**
 Texas Transportation Inst., College Station.
Handbook for Building Homes of Earth.
 Lyle A. Wolfskill, Wayne A. Dunlap, and Bob M. Gallaway. 1968, 160p* Rept no. Bull-21
 Prepared in cooperation with Housing and Home Finance Agency, Washington, DC.

Descriptors: *Housing, Soils, *Soils, Construction, Handbooks, Stabilization, Earth-handling equipment, Foundations(Structures), Walls, Compacting, Compressive properties, Tensile properties, Floors.
Identifiers: Adobe, Roof.

Contents: Introduction-types of earth houses; Soils and what can be done with them; Soil stabilizers; Site preparation; Foundations; Lightweight roofs; Getting the soil prepared; Making adobe blocks; Making pressed earth blocks; Making walls of pressed blocks; Making walls of rammed earth; Roofs for earth houses; Floors for earth houses; and Surface coatings.

PB-179 329 **PC A04 MF A01**
 Department of Housing and Urban Development, Washington, DC. Div. of International Affairs.
Village Housing In the Tropics.
 Jane B. Drew. Jun 67, 71p
 Prepared in cooperation with Agency for International Development, Washington, DC.

Descriptors: *Housing, Africa, Public health, Hygiene, Protection, Water supplies, Insects, Contamination, Soils, Erosion, Rivers, Animals, Economics, Agriculture, Wind, Construction materials, Design, Ventilation, Tropical regions.
Identifiers: West Africa.

Agriculture is the foundation of wealth in West Africa. The concomitant of agriculture is villages. The creation of efficient villages where a high standard of life is possible is a prime town planning responsibility of the coast. The stabilization of an agriculture based on the rotation of crops rather than shifting cultivation will help the permanent location of villages as well as combat two great evils: soil erosion caused by heedless destruction of the forests, and soil impoverishment. Mining and fishing villages have not been dealt with separately since their location is fixed, but in general they follow the same principles outlined for other villages. In siting a village the obvious factors controlling its position are farming land, water, and accessibility to main roads, or sometimes to sea or streams. (Author)

PB-179 359 **PC A04 MF A01**
 Department of Housing and Urban Development, Washington, D.C.
Urban Planning in Developing Countries.
 Ideas and Methods Exchange No. 61
 Lloyd Rodwin. 1968, 68p

Descriptors: *Urban planning, Venezuela, *Management planning, Urban areas, Housing, Population, Transportation, Industries, Site selection, Terrain, Control, Natural resources, Petroleum, Roads, Buildings, Economics.
Identifiers: AID(Agency for International Development), Ciudad Guyana(Venezuela).

The study describes the job of the city planner in developing countries. It does this by examining a single case, the planning of Ciudad Guayana, a city being built in Venezuela, and it looks at this city planning endeavor from two points of view. It examines this still on-going enterprise from the standpoint of urban planning technique - how does the urban planner in such a setting do his work - and in addition, it tries to suggest something of the functions which such an urban planning enterprise may have in a developing country. For while certain features of the case described are characteristic only of Venezuela, or of the problems of new cities, many of the problems confronted and tech-

SELECTED APPROPRIATE TECHNOLOGIES

niques used are relevant to urban, regional and national programs throughout the world. (Author)

PB-179 361 PC A03 MF A01
 Department of Housing and Urban Development, Washington, DC. Div. of International Affairs.
Plant Requirements for Manufacture of Building Bricks.
 Jun 67, 34p

Descriptors: *Brick, *Manufacturing methods, Industrial plants, Costs, Labor, Specifications, Machine tools, Site selection, Buildings, Money, Budgets, Industrial production, Clay, Shale, Mud, Driers(Apparatus), Inventory, Economics, Tropical regions.
 Identifiers: Area planning aid development.

The purpose of this report is to present basic information for establishing and operating a building brick plant in a country with a tropical or semi-tropical climate. The information includes general manufacturing methods, plant layout, and costs of materials, equipment, and labor. The plant described is considered to be the economic minimum in size which utilize suitable equipment and methods. Products are to be simple and varieties limited in order that costs may be kept to a minimum. (Author)

PB-179 363 PC A02 MF A01
 Department of Housing and Urban Development, Washington, DC. Div. of International Affairs.
Housing in Liberia.
 Jun 67, 20p*
 Country Report Series.

Descriptors: *Economics, Africa, *Housing, Africa, Geography, Climatology, History, Political science, Population, Agriculture, Mining engineering, Transportation, Communication systems, Commerce, Construction materials, Labor, Professional personnel, Urban planning, Rural areas, Law, Banking, Costs, Foreign aid, Statistical data.
 Identifiers: Liberia, Area planning and development.

The report on housing in Liberia is one of a series of reports on housing and related subjects in developing countries. The series is issued by the Office of International Housing (OIH) of the Housing and Home Finance Agency (HHFA) as a service to the Agency for International Development (A.I.D.). The individual country reports are designed to assist in the orientation of A.I.D. technicians either in the United States or abroad. They are also intended to provide basic information to consultants scheduled to undertake overseas assignments as well as to American businessmen interested in foreign investment. (Author)

PB-179 365 PC A04 MF A01
 Department of Housing and Urban Development, Washington, DC. Div. of International Affairs.
Housing in the Ivory Coast.
 Thomas R. Callaway. Apr 66, 62p*
 Country Report Series.

Descriptors: *Economics, Ivory Coast, *Housing, Ivory Coast, Geography, Climatology, History, Political science, Population, Employment, Transportation, Banking, Construction materials, Prefabricated buildings, Costs, Sanitary engineering, Labor, Wages, Rural areas, Urban planning, Foreign aid, Statistical data.
 Identifiers: Area planning and development.

No abstract available.

PB-179 366 PC A02 MF A01
 Department of Housing and Urban Development, Washington, DC. Div. of International Affairs.
Housing in Nigeria.
 Jun 67, 18p*
 Country Report Series.

Descriptors: *Economics, Nigeria, *Housing, Nigeria, Geography, Climatology, History, Political science, Population, Construction materials, Professional personnel, Urban planning, Rural areas, Law, Foreign aid, Banking, Costs, Statistical data.

Identifiers: Area planning and development.

No abstract available.

PB-179 367 PC A04 MF A01
 Department of Housing and Urban Development, Washington, DC. Office of International Housing.
Housing in Ethiopia.
 Country Report Series.
 Jan 66, 71p*

Descriptors: *Economics, Ethiopia, *Housing, Ethiopia, Geography, Climatology, History, Political science, Education, Population, Agriculture, Mining engineering, Industries, Transportation, Communication systems, Commerce, Banking, Construction materials, Urban planning, Rural areas, Costs, Manpower, Wages, Statistical data.
 Identifiers: Area planning and development.

No abstract available.

PB-179 376 PC A03 MF A01
 Department of Housing and Urban Development, Washington, DC. Div. of International Affairs.
Squatter Settlements. The Problem and the Opportunity.
 Ideas and Methods Exchange no. 63, 302 Urban Planning
 Charles Abrams. Apr 66, 49p

Descriptors: *Urban areas, Housing, Social sciences, Law, Economics, Population, Public opinion, Sewage, Urban planning, Advanced planning, Costs, Safety, Site selection, Employment, Public health, Structures, State-of-the-art reviews.
 Identifiers: Area planning and development, *Squatters.

The report discusses the world-wide problem of 'squatters' in urban slums. The legal and economic problems associated with squatter villagers are examined.

PB-179 383 PC A03 MF A01
 Department of Housing and Urban Development, Washington, DC.
Sewage Lagoons for Developing Countries.
 Ideas and Methods Exchange No. 62, 302/12/1 Sewage Lagoons.
 Thomas Callaway, and Bernard Wagner. Jan 66, 41p
 Prepared in cooperation with Department of State, Washington, DC. Agency for International Development.

Descriptors: *Urban planning, *Wastes(Sanitary engineering), Sewage, Wastes(Industrial), Rural areas, Housing, Humans, Drainage, Irrigation systems, Water, Site selection, Soil mechanics, Evapotranspiration, Advanced planning, Public health.
 Identifiers: BOD(Biochemical oxygen demand), Area planning and development, Sewage lagoons.

Many cities in developing countries lack acceptable community sewage disposal systems. The failure to provide safe, effective means of disposing of human and other wastes present problems, the seriousness of which cannot be overestimated. The cost of constructing adequate treatment plants often discourages their installation in cities with limited budgets. However, treatment is possible by means of sewage lagoons which are usually less expensive than more conventional methods. (Author)

PB-179 408 PC A03 MF A01
 National Council on the Aging, Inc., New York.
Operation III: Loaves and Fishes. A Model Community Action Program to Provide Nutritious Low-Cost Meals to the Elderly.
 Final rept.
 Geneva Mathiasen, and Jack Ossofsky. 23 Jul 56, 34p
 Contract OEO-79

Descriptors: *Food, *Adults, Costs, Sociology, Aging(Physiology), Employment, Training, Education, Nutrition, Costs.
 Identifiers: Loaves and fishes operation.

The major purpose of this project is to provide nutritious meals and footduds at low cost to older persons living on marginal or poverty level incomes. Meals will be prepared so that they may be eaten where purchased, or packaged so they may be carried home or delivered to the homebound when necessary. In addition to providing meals, the project will seek to stretch the limited incomes of the elderly through implementation of surplus food programs, food stamp plans, and the development of marketing, home economics and related consumer education. Social action in connection with matters of consumer concern and protection will be encouraged. The project will provide employment opportunities for residents of the community being served, including the elderly, as well as opportunities for volunteer services by those who can afford to give of their time. Intensive community relations and case finding will be undertaken to insure maximum utilization of the program by the elderly. (Author).

PB-179 475 PC A08 MF A01
 Memphis and Shelby County Planning Commission, Memphis, Tenn.
Community Facilities Study. Volume III. Sanitary Sewers.
 Comprehensive planning rept.
 Feb 68, 164p*

See also Volume 2, PB-179 474. Prepared in cooperation with Allen and Hoshall-Clark, Dietz and Assoc., Memphis, Tenn. PORTIONS OF THIS DOCUMENT ARE ILLEGIBLE. SEE INTRODUCTION SECTION OF THIS ANNOUNCEMENT JOURNAL FOR CFSTI ORDERING INSTRUCTIONS. Availability: Original document in color until exhausted.

Descriptors: *Urban planning, Tennessee, *Sanitary engineering, Tennessee, Sewage, Predictions, Construction, Costs, Population, Rivers, Maps, Urban areas, Rural areas, Water pollution, Wastes(Industrial).
 Identifiers: Area planning and development, Land use, Memphis(Tennessee), Evaluation, *Interceptor sewers, Shelby County(Tennessee).

Described in this report are the lengths, sizes and approximate locations of sanitary sewers needed to provide service to Shelby County through the year 1990. The results of an extensive investigation of the existing interceptor sewers in the County is also included. The construction of the needed sewers is divided into five-year increments beginning in 1970. Sewer capacity was determined by studying population forecasts and land use predictions for the County. Estimated construction costs for each phase are presented with unit costs being forecast for the future based on previous construction data. A detailed study of the sewage treatment needs for the County is currently being prepared for the City of Memphis, however, preliminary costs of these facilities are included in the report. (Author)

PB-180 245 PC A03 MF A01
 Cooperative League of the USA, Chicago, Ill.
Potential Cooperative Projects.
 Final feasibility rept.
 Stanley Dreyer. 28 Dec 65, 28p
 Contract OEO-598

Descriptors: *Organizations, Feasibility studies, Standards, Management planning, Urban areas, Rural areas, Budgets, Training.
 Identifiers: Cooperative projects, Community action programs, Chicago(Illinois), St.

No abstract available.

PB-180 476 PC A03 MF A01
 Clapp and Mayne, Inc., San Juan, Puerto Rico.
Feasibility Study for Establishing a Bicycle Manufacturing Plant in Puerto Rico.
 Final rept.
 Dec 68, 44p
 Contract DC-8-35352

Descriptors: *Industrial plants, *Vehicles, *Puerto Rico, Industrial plants, Feasibility studies, Economics, Commerce, Assembling, Production, Costs.
 Identifiers: Bicycles.

SELECTED APPROPRIATE TECHNOLOGIES

A study was made to establish the economic feasibility of manufacturing bicycles to satisfy the small but growing internal Puerto Rican market. However, during the course of the investigation, the Consultants became aware of a series of developments in the United States bicycle market that, upon further investigation, led them to broaden the original scope of the study to include an evaluation of the feasibility of producing bicycles in Puerto Rico for sale in this market and for shipment to the United States. Nonetheless, the original concept of a local market-oriented factory has been kept intact, so the study provides an evaluation of that possibility independently of an export market. (Author)

PB-180 509 **PC A06 MF A01**
Johns Hopkins Univ., Baltimore, Md. Dept. of Sanitary Engineering and Water Resources.

An Evaluation of the Problems of Sanitary Sewer System Design.

Final rept.
John C. Geyer, and John J. Lentz. Sep 64, 114p*
FHA-564
Technical studies publication.

Descriptors: *Sanitary engineering, Sewage, *Wastes(Sanitary engineering), Pipes, Water supplies, Housing, Maintenance, Costs, Urban areas, Rural areas, California, Maryland, Florida, Missouri.

Identifiers: Evaluation, *Sewer systems.

General problems facing sewer designers have been studied using field data collected in four U. S. communities. Analysis of these data indicates that basic causes of maintenance difficulties are tree roots, accumulations of debris in the absence of roots, other causes, and in areas having cohesionless sub-soil, sewer cave-ins. Proportionately fewer blockages occur when grades are moderate, and proportionately more occur at the upper terminals of the sewers. In eight-inch pipe, manhole spacing has little effect on the labor costs of stoppage relief. Emphasis is placed on statistical techniques for estimating domestic sewage flow. Flow of rainwater and groundwater was at times found to be excessive in all systems studied. Limited data on costs of operating and maintaining sewage pumping stations are reported and evaluated. (Author)

PB-182 735 **PC A02 MF A01**
Department of Forestry and Rural Development, Vancouver (British Columbia). Forest Products Lab.

Wood Species and Glues Influence Plywood Bond Durability.
Information rept.

P. L. Northcott. Aug 68, 24p* Rept no. VP-X-42

Descriptors: *Plywood, *Bonding, Wear resistance, Adhesives, Specifications, Thickness, Roughness, Classification, Exposure, Regression analysis, Degradation, Loading(Mechanics), Effectiveness.

Identifiers: Graphs(Charts).

The research demonstrates that durability of 3/8 in., 3-ply plywood manufactured with a single glue is strongly dependent on the species of wood. Furthermore, the influence of species on durability tends to be different for each type of glue. Twelve 4'-squared panels of plywood were manufactured from each of the combinations of six species of wood and ten glues. Plywood shear specimens were subjected to each of six bond-degrading systems for times up to 160 days. (Author)

PB-182 764 **PC A02 MF A01**
Department of Forestry and Rural Development, Vancouver (British Columbia). Forest Products Lab.

Balsam Woolly Aphid-Infested Abies Wood as a Source of Pulp Fibre.
Information rept.

K. Hunt. May 68, 25p* Rept no. VP-X-39

Descriptors: *Hemiptera, Wood, *Wood pulp, Sources, Trees, Pest control, Chemicals, Life cycle, Damage, Eggs, Wind, Airborne, Climatology, Physical properties, Cell wall, Economics, Canada.

Identifiers: Adelges piceae, Fir trees.

The life cycle of the balsam woolly aphid (Adelges piceae Ratzburg) and its effect on trees and wood of various Abies species is briefly described. Several methods, natural and chemical, for controlling the pests are cited. The effect of advanced infestation on the quality of pulp produced from Abies wood by the different industrial processes is shown to include a reduction in yield of 10% and a decrease in strength of 20 to 30%. Recommendations regarding further pulping research are made in the light of various economic considerations. It is recommended that a detailed polysaccharide analysis be carried out on the aphid-infested wood of Abies balsamea. (Author)

PB-184 123 **HC A09 MF A01**
Kaiser Engineers, Oakland, Calif.

In-Cities Experimental Housing Research and Development Project, Phase I. Composite Report, Volume III. technology.

Mar 69, 181p* Rept no. KE-69-8-R-4

Contract HUD-H-1011

Compiled from Phase I reports prepared by Building Systems Development, Inc., Contract HUD-H-971; Westinghouse Electric Corp., Contract HUD-H-970; and Abt Associates, Inc., Contract HUD-H-969. See also Volume 2, PB-184 122 and Volume 4, PB-184 124.

Descriptors: *Urban planning, Housing projects, Construction, Urban areas, Design, Configuration, Materials, Structural parts, Manufacturing methods, Assembling, Cooling, Heating, Electrical equipment, Industries, Indexes.

Identifiers: *Modular construction, *Low cost housing.

The objective of this report is to present for public information the useful data on technological innovation in low-cost housing collected by the three Phase I Contractors. During Phase I, a large file of data on innovative systems and components was accumulated. Some of these systems and components had been tested and others were in the design stage only. Some had been used in foreign countries but not in the United States. This file of data has been assembled in this volume for use as a general guide to those concerned with the planning and construction of low-cost housing. (Author)

PB-184 450 **HC A07 MF A01**

Mater Engineering Corvallis, Oreg.
A Feasibility Study for a Small LOG Sawmill on the Fort Apache Indian Reservation in Central Arizona.

Apr 69, 137p*

Contract C-8-3529

Descriptors: *Wood, Cutting, *Industrial plants, *Arizona, Rural areas, Feasibility studies, Industrial production, Forestry, Sources, Costs, Configuration, Operation, Predictions, Economics, Sociometrics.

Identifiers: Indian reservations, *Sawmills, Fort Apache(Arizona).

The study investigated the feasibility of constructing an additional sawmill facility on the Fort Apache Indian Reservation to saw small logs which the existing mill cannot handle profitable. The study included a survey of the wood supplies and the selection of the optimum log conversion configuration to profitable convert the available small logs into saleable lumber and chips. Eight configurations were studied for converting the small logs to lumber. An in-depth analysis resulted in projected operating statements which indicate that this small log mill should be economically advantageous to the Tribe. (Author)

PB-184 876 **HC A09 MF A01**
National Bureau of Standards, Washington, D.C. Inst. for Applied Technology.

The Performance Concept: A Study of Its Application to Housing, Volume Two.

John P. Eberhard. 3 Jun 69, 194p*

Revision of Rept. no. NBS-9850 dated 3 Jun 68. See also Volume 1, PB-184 458, and Volume 3, PB-184 459. Sponsored in part by Department of

Housing and Urban Development, Washington, D.C.

Descriptors: *Housing, Standards, Design, Specifications, Costs, Structural properties, Rural areas, Management planning, Decision making, Economics, Money, Law, Public health, Life expectancy, Sociology, Alaska.

Identifiers: Low cost housing, Poverty, Ethnic groups, Indian reservations, Problem solving, Building codes.

This report, in three volumes, is the result of a study conducted by the Institute for Applied Technology of the National Bureau of Standards for the Department of Housing and Urban Development. This study investigated the following hypothesis: 'It is hypothesized that if adequate performance standards for low-cost housing could be developed, and if they were broadly used, an important and fundamental way would have been opened to accommodate the introduction of cost-reducing innovations into the design of low-cost housing.' The report finds this hypothesis to be generally correct, but emphasizes the need for the development of the necessary knowledge to implement the performance concept. This volume contains appendices titled as follows: Needs of the rural poor in low cost housing; Housing of Indians on reservations and of Alaskan natives; Conceptual structure of low cost/low income housing; Nature of the problem; Implementation of the performance concept in regulatory and acceptance systems such as the minimum property standards.

PB-185 168 **HC A05 MF A01**
Bureau of Public Roads, Washington, D.C. Environmental Development Div.
Literature References to Highways and Their Environmental Considerations.

1 Jul 69, 90p*

Descriptors: *Roads, *Environment, *Management planning, Roads, Urban planning, Rural areas, Sociology, Economics, Physical properties, Air pollution, Transportation, Bibliographies, Abstracts.

Identifiers: Land use, Noise pollution.

The report is in four sections: a bibliography, keyed and cross-referenced to six broad areas of interest; the staff selections; the abstracts; and a subject index. (Author)

PB-186 188 **HC A08 MF A01**
National Swedish Inst. for Building Research, Stockholm (Sweden).
Social Aspects of Housing and Urban Development.

1969, 166p* Rept no. Byggforskningen-3:1969
Paper copy also available from The National Swedish Institute for Building Research, Box 27 163, S-102 52, Stockholm 27, Sweden. Sw. Kr. 20.

Descriptors: *Urban planning, Housing, *Housing, Bibliographies, Economics, Sociology, Africa, Asia, Australia, Central America, South America, Europe, North America, Abstracts.

Identifiers: Low cost housing, Developing countries.

The bibliography is part of a continuing project of the Housing Section of the United Nations Centre for Housing, Building and Planning. The aim of the bibliography was to provide a broad view of the published literature dealing with the experience of countries which have made substantial progress in solving the social problems of housing and urban development, paying particular attention to such aspects as: an appropriate programme of economic development in urban and rural areas leading to an accelerated raising of the standard of living, the provision of appropriate dwellings for all, the initiation and construction of housing for low-income families, the keeping of rents within a reasonable share of family incomes, the improvement of existing housing and the clearance of slums. (Author)

PB-187 565 **HC A09 MF A01**
Steffie Associates, Inc., Laguna Beach, Calif.
The Small New Business.

Final rept.

SELECTED APPROPRIATE TECHNOLOGIES

Volney Steffire. Aug 69, 181p*
Contract OEO-4786

Descriptors: *Commerce, *Management planning, Starting, Organizations, Industries, Economics, Motivation, Money, Sociology, Production control, Predictions, Site selection, Growth, Computer programs, Costs.

Identifiers: *Small businesses, *Economic development, Marketing, Product development, Accounting, Profits, Cash flow, Computer analysis.

Contents: The general problem; Finance; Marketing; Production; Organization; Starting a new small business; Growth and/or decline; The nature of a small business development company.

PB-187 841 HC A09 MF A01
Texas A and M Univ., College Station. Water Resources Inst.

A Study of the Economic Impact of Water impoundment Through Validity Testing of a Comparative-Projection Model.

Technical rept.

John E. Pearson, and Kenneth E. Heideman. Aug 69, 183p* TR-20, OWRR-B-019-TEX(1)
Contract DI-14-01-0001-1553

Descriptors: *Economics, *Texas, *Dams, Water supplies, Impact, Reviews, Mathematical prediction, Mathematical models, Population, Recreation, Statistical data, Urban areas, Rural areas, Lakes, Programming(Computers).

Identifiers: *Reservoirs, Computer models, Investments, Computerized simulation, Validity testing.

An established economic simulation model for reservoir development was applied to ten reservoir projects throughout Texas. The model as a predictor of economic impact was given a difficult test because of the diversity of geographic, economic, and social characteristics surrounding the reservoirs. Additional difficulty was provided because the reservoirs were in different development stages-construction, fill-up, and post fill-up. A synthetic (business activity) index was developed for measuring accuracy of the model in the thirteen reservoir areas. (Author)

PB-188 799 HC A03 MF A01
Temple Univ., Philadelphia, Pa. Bureau of Economic and Business Research.

The Economic Implications of the Interconnection of Urban Water Systems.

Paul Seidenstat. 1969, 37p* Occasional-paper-2, W70-02737
Contract DI-14-01-0001-1976

Descriptors: *Urban areas, Water supplies, *Water supplies, Networks, Management planning, Economics, Feasibility studies, Rural areas, Periodic variations, Systems engineering, Reclamation, Population, Costs, Statistical data.

Identifiers: Philadelphia(Pennsylvania), *Water supply interchanges, Water treatment, Intercity water systems, *Emergency water interconnections.

Much concern has been expressed in recent years about the problem of meeting the anticipated increase in demand for water in the United States. In terms of meeting the demand augmentation of the water supply at the lowest possible cost would appear to be a widely held objective in water system management. Economists are now stressing the idea that more efficient use of existing water facilities and sources of supply may be an economically superior alternative to expensive supply augmentation projects. The contention of this paper is that there are possibilities for interchange of water among adjacent water systems that have not been fully explored and that using these interconnections can be a lower-cost method of expanding the treated water supply than having each system augment its own supply independently. (Author)

PB-188 841 HC A02 MF A01
Illinois Univ., Urbana. Water Resources Center.
Impact of Community Water Systems in Small Towns.
Final rept. 1 Sep 67-30 Jun 68

Walter J. Wills, and Donald D. Osburn. Jun 69, 20p WRC-RR-20, OWRR-A-027-ILL(1)
Contract DI-14-01-0001-1081

Descriptors: *Water supplies, *Urban areas, Management planning, Fire safety, Sanitary engineering, Installation, Rural areas, Illinois.

Identifiers: Water consumption.

The primary purpose of this study was to describe the impact the addition of a community water system to a small town would have upon that town and the surrounding communities. The benefits of the system were recognized by the residents and some of the first round impacts were measured. Benefits observed were increases in the number of water using appliances, increases in property values, improved fire protection and sanitary conditions. (Author)

PB-188 851 HC A07 MF A01
Department of Housing and Urban Development, Washington, D.C. Div. of International Affairs.

A Proposed Urban Development Program for Tegucigalpa, Honduras.

James A. Moore. 25 Aug 67, 134p Rept no. PASA-LA(KA)-53-67

Sponsored in part by Agency for International Development, Washington, D.C.

Descriptors: *Urban planning, *Honduras, *Housing, Urban planning, Costs, Management planning, Training, Government(Foreign), Economics.

Identifiers: *Tegucigalpa(Honduras), Developing nations.

The report describes an urban development program prepared for Tegucigalpa, including urban planning, public finance, public administration, and training. The program seeks to institutionalize the planning function in Tegucigalpa to enable the government to prepare, finance, and administer such plans, and to encourage local citizen participation. (Author)

PB-188 852 HC A03 MF A01
FCH International, Inc., Washington, D.C.

Housing the Campesino. A Case Study of Cooperative Housing in Rural Panama.

1966, 28p
Sponsored in part by Agency for International Development, Washington, D.C.

Descriptors: *Rural areas, Housing, *Housing projects, *Panama, Wages, Economics, Costs, Research program administration, Management planning.

Identifiers: Los Pocitos(Panama), Developing nations, Low income families.

The report describes a case study of cooperative housing in Los Pocitos, Panama. It describes the organization and administration of the housing program, the design and financing of typical houses in the project, and its applicability in other locations. (Author)

PB-188 918 HC A05 MF A01
Department of Housing and Urban Development, Washington, D.C. Div. of International Affairs.

Earth for Homes: Ideas and Methods Exchange No. 22.

May 69, 79p*
Revision of report dated Sep 56.

Descriptors: *Housing, Construction materials, *Construction materials, *Soils, Buildings, Construction, Soil mechanics, Walls, Floors, Roofs, Compacting, Cements, Weatherproofing, Structural properties, Finishes + finishing, Test methods, Brick, Mud, Earthquake-resistant structures, State-of-the-art reviews.

Identifiers: *Earth construction, Soil compacting, Soil aggregates, Admixtures, Pozzolans, Soil properties, Soil cement, Cob construction, Adobe brick, Wattle and daub.

Contents: Early uses of earth; Soils; Methods of earth wall construction; Stabilization of earth by admixtures; Earth floors; Earth roofs; Wall finishes; The design of earth walls.

PB-188 919 HC A08 MF A01

Department of Housing and Urban Development, Washington, D.C. Div. of International Affairs.

Handbook for Building Homes of Earth.

Lyle A. Wolfskill, Wayne A. Dunlop, and Bob M. Callaway. 1970, 161p*
Prepared in cooperation with Texas A and M Univ., College Station.

Descriptors: *Housing, Construction, *Construction materials, *Soils, Design, Soil mechanics, Site selection, Preparation, Foundations(Structures), Roofs, Walls, Floors, Manufacturing methods, Compacting, Presses(Machinery), Finishes + finishing, Weatherproofing, Handbooks.

Identifiers: *Earth construction, Soil tests, Soil compacting, Soil stabilization, Pressed earth blocks, Adobe blocks.

Contents: Introduction--types of earth houses; Soils and what can be done with them; Soil stabilizers; Site preparation; Foundations; Lightweight roofs; Getting the soil prepared; Making adobe blocks; Making pressed earth blocks; Making walls of pressed blocks; Making walls of rammed earth; Roofs for earth houses; Floors for earth houses; Surface coatings.

PB-188 921 HC A04 MF A01

Department of Housing and Urban Development, Washington, D.C. Div. of International Affairs.

Bamboo as a Building Material.

F. A. McClure. Jun 67, 58p
Revision of reports dated May 53 and Jun 67.

Descriptors: *Housing, Construction materials, *Construction materials, Plants(Botany), Buildings, Foundations(Structures), Supports, Floors, Walls, Doors, Roofs, Pipes, Reinforcing materials, Reinforced concrete, Abundance, Structural properties, Preservation, Construction, Small tools.

Identifiers: *Bamboo, Frames, Ceilings(Architecture), Windows, Troughs, Biogeography.

Contents: Parts of a house for which bamboos are suitable; Bamboo reinforcement of concrete; Geographical distribution of bamboos; Differences among species; Some bamboos used in housing; Shortcomings of bamboo and how to overcome them; Preservation; Skill requirements; Tool requirements; Differentiation and evaluation of species; Collecting specimens for identification.

PB-188 925 HC A05 MF A01

Department of Housing and Urban Development, Washington, D.C. Div. of International Affairs.

Physiological Objectives in Hot Weather Housing.

Douglas H. K. Lee. Jun 69, 83p*
Prepared in cooperation with Johns Hopkins Univ., Baltimore, Md. Revision of report dated May 63.

Descriptors: *Housing, *Tropical regions, *Heat tolerance, Housing, Physiology, Climatology, Humidity, Temperature, Buildings, Configuration, Reflection, Cooling, Solar radiation, Heat transfer.

The report presents an introduction to hot weather housing design. Hot dry and hot humid environments are included. (Author)

PB-188 926 HC A04 MF A01

Department of Housing and Urban Development, Washington, D.C. Div. of International Affairs.

Village Housing in the Tropics, with Special Reference to West Africa.

Keith H. Hinchcliff. Jun 69, 72p
Prepared in cooperation with Illinois Univ., Urbana. Revision of report dated May 63.

Descriptors: *Housing, Tropical regions, *Urban planning, *Subsaharan Africa, Site selection, Climatology, Terrain, Problem solving, Water supplies, Public health, Buildings, Construction materials, Culture, Nigeria, Ghana.

Identifiers: Villages, Community facilities, Sierra Leone, Gambia.

The document discusses the optimum location of villages, types of village layouts, housing design,

SELECTED APPROPRIATE TECHNOLOGIES

and community facilities, with special reference to West Africa.

PB-188 927 HC A03 MF A01
Department of Housing and Urban Development, Washington, D.C. Div. of International Affairs.
Bibliography on Housing Building and Planning.
May 69, 47p*

Descriptors: *Housing, *Bibliographies, Construction, Law, Standards, Urban planning, Rural areas, Terrain, Problem solving, Abstracts.
Identifiers: Self help housing, Architecture, Building codes.

The document contains an annotated listing of recent books and periodicals on aided self-help housing, architecture, building codes and standards, city and regional planning, housing, land problems, taxation, transportation, urbanization and zoning.

PB-188 931 HC A04 MF A01
Department of Housing and Urban Development, Washington, D.C. Div. of International Affairs.
Aided Self-Help In Housing Improvement.
Ideas and methods exchange.
Aug 69, 64p* Rept no. IME-18
Revision of report dated Jan 67.

Descriptors: *Housing, Construction, *Sociometrics, *Rural areas, Management planning, Costs, Labor, Standards, Construction materials, Terrain, Burma, Jamaica, Puerto Rico, Greece, Taiwan, Sweden.
Identifiers: Self help housing, Community development, Technical assistance.

The document discusses fundamental principles and role of aided self-help housing and how to organize self-help projects and secure technical and financial assistance. It describes programs in Burma, Jamaica, Puerto Rico, Greece, Taiwan and Sweden.

PB-188 933 HC A04 MF A01
Arizona Univ., Tucson.
Optimizing Salvageable Water Resources In a Semiarid Inland Basin.

Project Completion rept. Jul 67-Jun 69
W. Clyma, W. G. Matlock, W. J. McConnell, H. K. Qashu, and S. D. Resnick. Aug 69, 53p W70-02745

Descriptors: *Water supplies, *Arizona, *Water, Processing, Salvage, Management planning, Industries, Urban areas, Mathematical models, Control, Storage.
Identifiers: *Water reuse, *Salvageable water resources.

The investigation characterizes salvageable water resources in the semi-arid Tucson basin and evaluates appropriate treatment and control methods and management procedures for reuse of these salvageable waters. A preliminary inventory of salvageable water resources in the Tucson basin indicated a conservatively estimated annual total of 30,000 acre-feet available from municipal, industrial, and urban runoff sources. Little was known of the quality of urban runoff in this semi-arid environment, and efforts were directed toward exploratory sampling and analysis as indicators of potential problem areas in runoff quality. A ground-water recharge investigation at the Rillito Creek recharge site near Tucson produced a mathematical model which can be applied to alternative management schemes in the utilization or storage of salvage waters. Initial formulation of management alternatives appeared to require an improved system framework defining community objectives and criteria for salvaged water allocation. (Author)

PB-189 171 HC A05 MF A01
Hawaii Univ., Honolulu. Water Resources Research Center.
Identification of Return Irrigation Water In the Subsurface: Water Quality.
Project completion rept. 1 Jul 68-30 Jun 69

Pedro A. Tenorio, Reginald H. F. Young, and H. Collins Whitehead. Oct 69, 92p TR-33, OWRR-B-012-HI(1)
Contract DI-14-01-001-1495
Report on Identification of Irrigation Return Water in the Subsurface - Phase II.

Descriptors: *Water supplies, *Hawaii, *Irrigation systems, Water supplies, Quality control, Agriculture, Water wells, Sampling, Nitrates, Phosphates, Bromides, Carbonates, Fluorides, Calcium compounds, Magnesium compounds, Silicates, Sulfates, Rainfall, Chemical analysis, Solids, Tropical regions.
Identifiers: Pearl Harbor(Hawaii), Irrigation return water, *Oahu Island.

A joint research effort was undertaken by the Water Resources Research Center and the Honolulu Board of Water Supply to investigate the physical and chemical characteristics of irrigation return water in Pearl Harbor-Waipahu, Oahu, an area used for tropical agriculture. The project was started in 1967 and was expanded in 1968 to include Kahuku, Oahu and Central and West Maui. Well samples and profile samples were obtained with a thief sampler in the Pearl Harbor-Waipahu area and composite samples were obtained mainly from pumping wells in other areas. In addition, both spring and stream waters in the Pearl Harbor-Waipahu area were analyzed for a number of inorganic constituents. Stream waters in the main study area were observed to contain appreciable quantities of nitrate, phosphate, bromide, bicarbonate, and fluoride. Similar trends were observed with the spring samples, including increases of calcium, magnesium, silica, sulfate, and nitrate. Well waters from the main study area were evaluated according to Visher and Mink's index constituents, silica, sulfate, and nitrate, and other significant ionic compositions. General analysis of major constituents evidenced a cyclical trend in concentration, either related to seasonal rainfall and irrigation practices, or both. (WRSIC abstract)

PB-189 254 HC A02 MF A01
Department of Housing and Urban Development, Washington, D.C. Div. of International Affairs.
Establishing Savings and Loan Associations In Less Industrialized Countries.
Ideas and methods exchange
Ray J. Burroughs. 1967, 16p Rept no. IME-38

Descriptors: *Banking, Organizations, *Housing, Management planning, Government(Foreign), Standards, United States, Law, Personnel, Site selection, Reliability.
Identifiers: *Savings and loan associations, Developing countries, Expenses, Income.

U.S. savings and loan associations are used as an example for other countries desiring to establish financing institutions for funding new houses. Enabling legislation, interest, institution sponsorship, staffing, location and liquidity are all briefly discussed. (Author)

PB-189 255 HC A06 MF A01
Bureau of Water Hygiene, Rockville, Md.
Guidelines and Criteria for Community Water Supplies In the Developing Countries.
1969, 108p

Descriptors: *Water supplies, Management planning, *Management planning, Government(Foreign), Instruction manuals, Public health, Industries, Agriculture, Costs, Construction, Standards, Training, Maintenance, Quality control, Asia, Latin America.
Identifiers: Water resources, Developing countries, AID(Agency for International Development).

The report is a synthesis of ideas on guidelines and criteria developed from team surveys of community water supply programs in twelve developing countries, four of them in Asia and eight in Latin America. The purpose was to examine AID operations in this field and identify those factors contributing to the development of successful projects as well as those hindering such development. Chapters are devoted to policies, laws and institutions, program planning, capital financing, manpower and training, technical standards, project

development, contracts and construction, operation and maintenance, water utility management and developing public support. (Author)

PB-189 260 HC A05 MF A01
International Cooperation Administration, Kingston (Jamaica). Operations Mission.
Report of Housing Team of the International Cooperation Administration to the United States Operations Mission, Jamaica.
Charles Abrams, James G. Banks, J. Robert Dodge, Marvin S. Gilman, and Kalervo Oberg. Apr 61, 87p

Descriptors: *Urban planning, *Jamaica, Population, Economics, Sociometrics, Problem solving, Housing, Budgets, Organizations.
Identifiers: Squatter communities, *Kingston(Jamaica).

The report includes a description of population, economic and social conditions, tax structure, housing programs, and institutions concerned with construction financing. Urban development in the Kingston area is discussed. Recommendations for improving housing, industrial settlement, and strengthening financing methods are made. (Author)

PB-189 625 HC A03 MF A01
Department of Housing and Urban Development, Washington, D.C. Div. of International Affairs.
Housing in Ghana.
Country report series.
1964, 28p
Sponsored by the Agency for International Development, Washington, D.C.

Descriptors: *Housing, *Ghana, Urban planning, Construction, Wages, Population, Economics, Labor, Statistical data, Rural areas, Foreign aid.
Identifiers: Developing countries.

The report on housing in Ghana is one of a series of reports on housing and related subjects in developing countries. They are also intended to provide basic information to consultants scheduled to undertake overseas assignments as well as to American businessmen interested in foreign investment. (AID abstract)

PB-189 626 HC A02 MF A01
Department of Housing and Urban Development, Washington, D.C. Div. of International Affairs.
Housing In India.
Country report series.
1964, 25p
Sponsored by the Agency for International Development, Washington, D.C.

Descriptors: *Housing, *India, Urban planning, Law, Population, Economics, Construction, Labor, Rural areas, Government(Foreign), Statistical data, Research program administration, Foreign aid.
Identifiers: Developing countries, Slum clearance.

The report on housing in India is one of a series of reports on housing and related subjects in developing countries. They are also intended to provide basic information to consultants schedules to undertake overseas assignments as well as to American businessmen interested in foreign investment. (AID abstract)

PB-189 627 HC A02 MF A01
Department of Housing and Urban Development, Washington, D.C. Div. of International Affairs.
Housing In Jordan.
Country report series.
1965, 21p
Sponsored in part by the Agency for International Development, Washington, D.C.

Descriptors: *Housing, *Jordan, Urban planning, Statistical data, Population, Wages, Construction, Sanitary engineering, Labor, Industrial plants.
Identifiers: Developing countries, Construction loans.

SELECTED APPROPRIATE TECHNOLOGIES

The report on housing in Jordan is one of a series of reports on housing and related subjects in developing countries. They are also intended to provide basic information to consultants scheduled to undertake overseas assignments as well as to American businessmen interested in foreign investment. (AID abstract)

PB-189 628 HC A05 MF A01
Agency for International Development, Washington, D.C.
Housing and Urban Development Programs: Latin American Bureau.
Harold Robinson. 1 Oct 67, 91p

Descriptors: *Housing, *Latin America, Urban planning, Rural areas, Economics, Banking, Foreign aid, Construction, Statistical data, Law, Organizations, Wages.
Identifiers: Low income housing, Investments, Construction loans, Urbanization.

A summary at the beginning of the report includes sections titled: Background, accomplishments and tasks ahead. Other sections provide information on U.S. Congressional action, A.I.D. policy and suggested policy, and descriptions of regional and country programs including objectives, funding and progress. (AID abstract)

PB-189 771 HC A03 MF A01
Colorado State Univ., Fort Collins. Natural Resources Center.
Economics and Administration of Water Resources: Economics and Administration of Water.
K. C. Nobe. 30 Jun 69, 26p OWRR-A-005-COLO(8)

Descriptors: *Water supplies, Management planning, *Colorado, Water supplies, Natural resources, Economics, Law, Recreation, Contracts, Rural areas, Colorado.
Identifiers: Water resources, Water rights.

Progress on three separate phases of the research project are outlined: Role of economic base study; Evaluation of special study contracts with state water board; and Recreation property owner liability.

PB-189 813 HC A05 MF A01
Wisconsin Univ., Madison. Land Tenure Center.
Agricultural Cooperatives and Quasi-Cooperatives in Ghana, 1951-1965.
Marvin P. Miracle, and Ann Seidman. Jul 68, 79p
Rept no. LTC-51
Sponsored in part by Agency for International Development, Washington, D.C.

Descriptors: *Agriculture, *Ghana, *Economics, Agriculture, History, Organizations, Costs, Money, Labor, Commerce.
Identifiers: *Agriculture economics, Farm cooperatives, Land titles.

The report traces the history of cooperatives in Ghana from 1928 to 1965, bases on government records. From the beginning the movement has suffered from government domination, inept management and instability. Single or multi-purpose cooperatives have engaged in a wide range of economic activities: buying, selling, credit, subsidies, savings, research, extension and farming. Major successes appear to be in the marketing of export crops. Farmers seem eager enough to join cooperatives but sustained benefits from membership are not recorded. (AID abstract)

PB-189 816 HC A03 MF A01
Wisconsin Univ., Madison. Land Tenure Center.
An Experimental Cooperative Farming Plan In Chile.
William C. Thiesenhusen. Oct 65, 43p Rept no. LTC-8
Sponsored in part by Agency for International Development, Washington, D.C.

Descriptors: *Agriculture, *Chile, Management planning, Production, Organizations, Wages, Law.
Identifiers: *Cooperative farming, Land reform.

The report describes the organization and first-year operations of a small cooperative farm created by the Catholic Church. The 16 farm families are under administrative guidance of a hired administrator. Credit and technical assistance are furnished by INPROA, the church's agency to administer land reform on church properties. Data on farm income and expenses indicate that families earned more during the first year of the cooperative than in previous years. They did not earn enough to make payments on land purchased. If management of the cooperative can be improved, the cooperative probably can become free of debt. However, trained or experienced managers are scarce. (Author)

PB-189 818 HC A02 MF A01
Wisconsin Univ., Madison. Land Tenure Center.
Farm Ownership, Political Participation, and Other Social Participation In Central Brazil.
J. C. Van Es, and Robert L. Whittenbarger. Jul 68, 22p Rept no. LTC-50
Sponsored in part by Agency for International Development, Washington, D.C.

Descriptors: *Agriculture, *Brazil, *Economics, Agriculture, Political science, Sociology, Organizations, Rural areas.
Identifiers: Land titles, Social reforms, *Agriculture economics.

A test was made of the sociological thesis that land ownership is the basis of social class distinctions, and, more importantly, wide differences in economic and political power. From 255 to 289 farmers were studied. The findings indicate that the present structure of the rural sector does not provide the non-owners with an opportunity to effectively manage their own interests in the larger society. The virtual exclusion, purposive or not, of non-owners from social and political participation creates an environment in which they depend on more privileged community members to serve as brokers in their relations with the rests of the system. (AID abstract)

PB-189 819 HC A03 MF A01
Wisconsin Univ., Madison. Land Tenure Center.
The Influence of Land Tenure Institutions on the Economic Development of Agriculture In Less Developed Countries.
Peter Dorner. Oct 68, 35p Rept no. LTC-55
Sponsored in part by Agency for International Development, Washington, D.C.

Descriptors: *Agriculture, *Latin America, *Economics, Agriculture, Wages, Population, Control systems, Management planning, Money, Public relations.
Identifiers: *Land tenure, Developing countries, Rural to urban migration, Investments.

The document discusses the influence of land tenure systems upon income distribution and demand consequences, economic and political power distribution, investments in agriculture and supply consequences, investments in other sectors of the economy, and premature farm to city migrations. The existing relationships resulting from semi-feudal tenure systems are discussed. (AID abstract)

PB-189 820 HC A02 MF A01
Wisconsin Univ., Madison. Land Tenure Center.
Frei Unveils New Agrarian Reform Bill.
Marion R. Brown. Dec 65, 19p Rept no. LTC-11
Sponsored in part by Agency for International Development, Washington, D.C.

Descriptors: *Agriculture, *Chile, *Law, Agriculture, Management planning, Public relations, Population, Control systems, Rural areas, Economics.
Identifiers: *Land reform, Frei Eduardo.

The document describes features of the agrarian reform bill proposed to the Chilean Senate. Landowners can retain 80 hectares of land, and up to 320 hectares under certain conditions. Expropriated lands are paid for at tax assessed value. Also, compensation for improvements will be made. Each annual payment will be readjusted to 70 percent of the rise of the cost of living and will include

interest at 3 percent. The purchaser must live on the farm, keep up his payments, and join a cooperative. He cannot sell, divide, or give away his land without permission from CORA. The state can hold title to the land no longer than three years. Water rights are to be defined and administered under the proposed Bill. (AID abstract)

PB-189 831 HC A02 MF A01
Wisconsin Univ., Madison. Land Tenure Center.
Fitting Agricultural Extension to the Development Needs of Colombia.
Herman Feistelhausen. Nov 68, 21p Rept no. LTC-57
Sponsored in part by Agency for International Development, Washington, D.C.

Descriptors: *Agriculture, *Colombia, *Government(Foreign), Management planning, Organizations, Production control, Models(Simulations), Reviews, Inequalities, Economics.
Identifiers: Agricultural extension services, Developing countries.

The document analyzes the agricultural extension services in Colombia. The three largest organizations in this field employ 1400 full-time workers. These workers do not reach small farmers with less than 5 hectares.

PB-189 917 HC A03 MF A01
Wisconsin Univ., Madison. Land Tenure Center.
Agrarian Reform In the Dominican Republic: The Views of Four Consultants.
Peter Dorner, C. W. Loomer, Raymond Penn, and Joseph Thome. Dec 67, 46p Rept no. LTC-42
Sponsored in part by Agency for International Development, Washington, D.C.

Descriptors: *Economics, *Dominican Republic, Population, *Government(Foreign), Distribution(Economics), Rural areas, Agriculture, Law, Reviews.
Identifiers: Land repossession, Land reform, Credit, State owned lands.

The document contains three papers on what should be done about distribution of state-owned and repossessed (from Trujillo) lands. Since 60 to 70 percent of the population were in agriculture and from 25 to 30 percent of the people were unemployed, the distribution of lands and titles free to 20,000 farm families seemed reasonable. One percent of all existing farms contained 54 percent of all land in farms, while 50 percent of all farms were smaller than 2.5 acres each. The government could distribute nearly one million acres to as many as 48,000 families. (AID abstract)

PB-189 919T HC A02 MF A01
Wisconsin Univ., Madison. Lan Tenure Center.
Integrating the Rural Market Into the National Economy of Mexico.
Delbert T. Myren. Jun 68, 13p Rept no. LTC-46
Trans. of Comercio Exterior (Mexico) v17 n9 p706ff Sep 67. Presented at the Primer Congreso Nacional de Mercadotecnia, 21-23 Jul 1966, Cuernavaca, Morelos, Mexico.

Descriptors: *Economics, *Mexico, *Rural areas, Commerce, Population, Sociometrics, Agriculture, Fertilizers, Money, Management planning, Reviews.
Identifiers: Translations.

The document has classified Mexico's agriculture into three sectors: A modern, commercial farming sector which consists of 20 percent of the farm families, a growing transitional sector which includes a rough 45 percent of the farm families, and the traditional or subsistence sector - 35 percent of the farm families. No mass market for consumer goods will come into being, the author says, until 80 percent of the farmers sharply increase their purchasing power.

PB-189 920T HC A02 MF A01
Wisconsin Univ., Madison. Land Tenure Center.

SELECTED APPROPRIATE TECHNOLOGIES

Agrarian Reform, Land Purchase and Industrialization in Peru.

John Strasma. 1969, 22p Rept no. LTC-1
Trans. of Trimestre Economico (Mexico) v32(3)
n127 p484-500 Jul/Sep 65.

Descriptors: *Economics, *Peru, *Terrain, Management planning, Law, Government(Foreign), Industries, Money, Rural areas, Sociometrics, Reviews.

Identifiers: *Land reform, Translations, Land expropriation, Financing, Land owners.

The paper discusses a proposal for financing agrarian reform and stimulating industrialization in Peru. It is pointed out that the landowners would receive generous compensation for their lands in the form of marketable inflation-proof securities, with support or guarantees by international organizations or foreign governments.

PB-189 925 HC A09 MF A01
International Cooperation Administration, Washington, D.C.
Latin American Usoms Seminar on Agrarian Reform, Santiago, Chile, Feb. 21 - 24, 1961.

1961, 193p
PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE.

Descriptors: *Agriculture, *Latin America, *Terrain, Management planning, Symposia, Economics, Organizations, Problem solving, Standards, Employment, Sociometrics, Law.
Identifiers: *Land reform, Land ownership, Economic development, Farm size, Squatter farmers.

The purpose of the seminar was to discuss land reform policies and programs and their place in the economic development of Latin American countries; to make an appraisal of existing physical, human and institutional resources for carrying out such programs; and to determine the nature and amount of external assistance required from various agencies. (AID abstract)

PB-189 966 HC E99 MF A01
Wisconsin Univ., Madison. Land Tenure Center.
Problems and Conflicts over Land Ownership in Bolivia.
Ronald James Clark. Aug 68, 25 Rept no. LTC-49
Sponsored in part by Agency for International Development, Washington, D.C.

Descriptors: *Agriculture, *South America, *Terrain, Distribution, Money, Law, Rural areas.
Identifiers: Agricultural development, *Land tenure, Land use, *Bolivia.

The report describes two general types of conflict that have resulted from the delay in giving legal land titles to peasants for holdings as specified by the 1952 land reform program. The first kind of conflict arises between displaced landlords and the new owners. The second type results from land grabbing by peasants, competing claims for land owned by deceased peasants, disputes involving common lands, and claims based on supposedly legal titles. Landlords still exploit peasants by loaning them money at high interest rates, and by persuading them to sell the land back to the landlord at low prices. (AID abstract)

PB-189 969 HC A05 MF A01
International Cooperation Administration, Manila (Philippines).

Land Reform in the Philippines 1950-1958.

Rept. for Dec 55-Apr 58

Frate Bull. 1958, 94p

PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE.

Descriptors: *Economics, *Philippines, *Terrain, Management planning, Agriculture, Law, Population, Federal budgets, Organizations, Money.
Identifiers: *Land reform, Land tenure, Landlord tenant relationships, Land ownership.

The publication covers two projects on land tenure. It deals with tenancy after World War 2 and with actions to improve the farm tenancy situation,

sets up objectives, and describes accomplishments and unsolved land reform problems in 1958.

PB-189 972 HC A07 MF A01
Iowa Universities Mission to Peru.

Economic Development Through Agrarian Reform in the Central Sierra of Peru.

Economic study
Enrique Vigues-Roig. Jun 67, 150p Rept no. Iowa Peru ES-1

Prepared in cooperation with Agency for International Development, Lima, Peru.

Descriptors: *Economics, *Peru, *Terrain, Management planning, Problem solving, Agriculture, Mathematical models, Factor analysis, Organizations, Statistical data, Population, Sociometrics.

Identifiers: *Land reform, Economic development, Gross national product, Central Sierra region(Peru).

The report analyzes the conditions under which agrarian reform in Peru can be used to promote economic development. It describes problems encountered in the land reform program with respect to land valuation and land expropriation.

PB-189 973 HC A02 MF A01
Wisconsin Univ., Madison. Land Tenure Center.

The Role of the Ejido in Mexican Land Reform.

Discussion paper
Nathan L. Whetten. May 63, 8p Rept no. DP-3

Descriptors: *Economics, *Mexico, *Terrain, Management planning, Law, Population, Transformations, Control systems, Sociometrics, Rural areas, Agriculture.

Identifiers: Ejido system, *Land reform, Collective farms, Socioeconomic status.

The document is concerned with the ejido system in Mexico, one in which the property rights in land are vested in the community. A farmer may be given use of the land for his lifetime, and he might pass it on to an heir but he may not sell it, nor can he rent it. If he does not work it for two years in succession, it will be taken away and assigned to some one else. The author points out the ejido system has served a very valuable purpose but it now needs revision to meet changing social conditions in Mexico.

PB-189 976 HC A03 MF A01
Wisconsin Univ., Madison. Land Tenure Center.

Freedom and Development. Rural Decision-Making and Agricultural Development.

Richard W. Patch. Jul 66, 37p Rept no. LTC-22
Sponsored in part by Agency for International Development, Washington, D.C.

Descriptors: *Agriculture, Economics, *Economics, *South America, *Management planning, Agriculture, *Peru, Agriculture, Rural areas, Decision making, Production, Attitudes, Population.

Identifiers: Agricultural development, *Bolivia.

The subsistence farmer has little freedom of choice in his decisions, as he must produce to survive. Freedom to decide, to experiment and to risk is infinitely greater among commercial farmers. Patch contrasts peasants in Cochabamba, Bolivia where land reform transpired with highland peasants of Peru where no reforms had occurred. The Bolivian peasant functions in an environment conducive to development, with considerable freedom of choice. The Peruvian peasant is a near-serf with almost no freedom. The Bolivian peasant has improved his economic, social and political statuses since land reform in 1953. He sells more products and he buys more goods produced in the city. The highlander is no longer an Indian; he is a person, and with increasing independence. The Peruvian neighbor has experienced no comparable changes. (Author)

PB-189 984 HC A04 MF A01
Agency for International Development, Tegucigalpa (Honduras).

Honduran Agrarian Reform Law. Report Number 2. Recommendations for Implementation.

John C. O'Byrne. 1966, 63p

Descriptors: *Economics, *Honduras, *Law, Terrain, Law, Agriculture, Effectiveness, Reviews, Money.

Identifiers: Squatter land, *Land reform, Economic development, Credit, Taxes.

The report is a review of the 1963 Honduran agrarian reform law. The purpose of the study is to determine whether the existing law is workable and meets the needs of the various intended parties or whether the law and amendments are totally usable. The report makes an analysis of the problems and sets forth recommendations which include suggestions to amend the present law to upgrade the agrarian reform agency; assure the companies that the government is deeply concerned with their welfare; and encourage and protect investment in agriculture as a means of promoting social and economic improvement. (AID abstract)

PB-189 987 HC A03 MF A01

Iowa Universities Mission to Peru.

Economic Development Through Agrarian Reform in Peru. Part I. Nature of and Relationships Between Agrarian Reform and Economic Development. Part II. Analytical Structural Change Model for Analyzing Agrarian Reform Structures and Remedial Alternatives in the Sierra.

John F. Timmons, and John C. O'Byrne. 1964, 35p
Contract ICAC-2226

Descriptors: *Economics, *Peru, *Terrain, Management planning, Agriculture, Problem solving, Population, Sociometrics, Money, Statistical data, Attitudes, Mathematical models, Training.

Identifiers: *Land reform, Central Sierra region(Peru), Economic development.

The report sets forth a method for analyzing defects in the agrarian land system and proposes remedial action with special reference to the Sierra. A model is formulated projecting agrarian reform as part of an integrated approach to economic and social development of the national economy. Included are goals and targets for agrarian reform.

PB-189 988 HC A10 MF A01
International Cooperation Administration, Manila (Philippines).

The Rural Philippines.

Generoso F. Rivera, and Robert T. McMillan. Oct 52, 216p

Descriptors: *Philippines, Economics, Geography, Rural areas, Social sciences, Population, Agriculture.

Identifiers: Land tenure.

The first part of the book is a pictorial story of rural life in the Philippines. It describes group life, culture, and natural resources of the Philippines. The section on population deals with numbers, distribution, age, sex, race, occupation, fertility, mortality and income. Agriculture in the Philippines is the chief source of livelihood for a large majority of the rural population. The intricate problems associated with Philippine agriculture are largely man-made, namely the smallness of the farms, insecure farm tenancy, shortage of farm credit, a lag in new farming methods, decreasing soil fertility and many others. Major institutions are directly related to the family, to ways of getting and using wealth and to religion, government, education, health, welfare and recreation. (AID abstract)

PB-189 989 HC A03 MF A01

Wisconsin Univ., Madison. Land Tenure Center.

Rural to Urban Migration: A Colombian Case.
Research paper

William L. Flinn. Jul 66, 45p Rept no. RP-19
Sponsored in part by Agency for International Development, Washington, D.C.

SELECTED APPROPRIATE TECHNOLOGIES

Descriptors: *Agriculture, Economics, *Economics, *Colombia, Population, Urban areas, Rural areas, Labor, Employment, Sociology, Housing.
Identifiers: *Urban migration.

The report presents the reasons for movement of farmers to urban areas. It discusses how rural to urban migration creates socio-economic development problems in both rural and urban sectors. The slum dwellers in shanty towns around cities believe that their housing, sanitation facilities, income, medical services, and education for children were better in the urban slums than in villages. Very few expressed a desire to return to rural areas. (AID abstract)

PB-189 991 HC A06 MF A01
 International Cooperation Administration, Manila (Philippines).

A Special Study of Landed Estates in the Philippines: Analysis and Findings.
 Arturo P. Sorongon. 22 Aug 55, 124p

Descriptors: *Economics, *Philippines, *Terrain, Distribution, Money, Law, Agriculture, Urban areas, Rural areas, Industries, Questionnaires, Analysis, Statistical data.

Identifiers: Landed estates, Land assessment, Land use.

The purpose of the report is to develop for the Department of Finance: (1) an analysis of the extent of distribution of large landholdings in the Philippines and (2) necessary statistical information on landed estates. (Author)

PB-189 992 HC A05 MF A01
 International Development Services, Inc., Washington, D.C.

Analysis and Recommendations on the Agrarian Reform Program in Ecuador.

Keith Himebaugh, Frank V. Beck, and Lisa Lekis. 15 Nov 66, 93p Rept no. P-6628
 Contract AID-518-162

Descriptors: *Agriculture, Economics, *Economics, Ecuador, Money, Sociology, Population, Rural areas, Production.

Identifiers: Agriculture economics, Agrarian reform.

The study gives a report on the financial problems of the Instituto Nacional de Reforma Agraria y Colonización (IERAC) which is the Ecuadorian agency for agrarian reform. Only \$21,319,153 equivalent in agrarian reform bonds have been issued since the enactment of the law. As a result of the shortage of bonds, important phases of the program are coming to a halt. Ecuador is reaching the practical limit of its ability to use foreign loans. It discusses other financial problems of IERAC and presents nine recommendations for present and future operation of this organization. (AID abstract)

PB-189 994 HC A05 MF A01
 International Cooperation Administration, Saigon (Republic of South Vietnam).

Studies of Land Tenure in Viet Nam (Terminal Report).

J. Price Gittinger. Dec 59, 89p

Descriptors: *Economics, *Vietnam, *Terrain, Management planning, Reviews, Leadership, Government(Foreign), Population, Communism, Money, Attitudes, Transformations, Law.

Identifiers: Land tenure, Collective farms.

The pamphlet is an account of land tenure in Viet Nam over a four-year period ending in 1959. It explains the major agrarian reform policies of the then President of Viet Nam, Ngo Dinh Diem and gives a general description of progress in agrarian reform. Also considered are communal land concepts in recent Vietnamese policy, Communist land policy in North Viet Nam, rent reduction and tenure security in free Viet Nam, the Vietnamese land transfer program, and basic Vietnamese land tenure legislation. (AID abstract)

PB-189 996 HC A11 MF A01
 Stanford Research Inst., Menlo Park, Calif.

Land Reform in Vietnam.

Summary rept.
 Dec 68, 240p
 Contract AID/VN -8
 See also Volume 1, Part 1, PB-189 997.

Descriptors: *Economics, *Vietnam, *Terrain, Management planning, Law, Attitudes, Population, Government(Foreign), Agriculture, Communism, Economics, Rural areas, Urban areas, Sociometrics.

Identifiers: Land reform, Land ownership, Viet Cong, Socioeconomic status.

The summary volume is a distillation of the information contained in the other volumes of the report. It is designed to provide the essential factual base on which rational land tenure policies in Viet Nam could be formulated.

PB-190 000 HC A08 MF A01
 Stanford Research Inst., Menlo Park, Calif.

Land Reform in Vietnam Working Papers. Volume III. The Viet Cong.

Donn E. Seeley, R. Michael Pearce, and Paul S. Taylor. Nov 68, 154p
 Contract AID/VN-8
 See also Volume 4 Part 1, PB-190 001, Volume 2, PB-189 999, and PB-189 996. Limited number of copies containing color other than black and white are available until stock is exhausted. Reproductions will be made in black and white only. PORTIONS OF THIS DOCUMENT ARE NOT FULLY LEGIBLE.

Descriptors: *Economics, *Vietnam, *Terrain, Management planning, *Communism, Impact, Population, Attitudes, Insurgency, Rural areas, Social psychology, Fear, Commerce, Agriculture, Reviews.

Identifiers: Land reform, Viet Cong, Landlord tenant relationships.

The volume describes the impact of Viet Cong activities on GVN land reform policies and on the rights of the landowners and tenants guaranteed them under the laws of the Republic of Vietnam. Detailed descriptions of Viet Cong land reform policies and practices are presented to provide a basis for assessing the feasibility of land reform measures in an environment of insecurity.

PB-190 001 HC A09 MF A01
 Stanford Research Inst., Menlo Park, Calif.

Land Reform in Vietnam Working Papers. Volume IV, Part 1. Surveys and Analyses Related to Land Tenure Issues.

Nov 68, 186p
 Contract AID/VN-8
 See also Volume 3, PB-190 000, Volume 4 Part 2, PB-190 002, and PB-189 996.

Descriptors: *Economics, *Vietnam, *Terrain, Management planning, Reviews, Population, Rural areas, Transformations, Sociometrics, Agriculture, Distribution(Economics), Attitudes, Statistical data.

Identifiers: Land reform, Land tenure, Land expropriation, Landlord tenant relationships, Socioeconomic status.

The document presents the major findings and analysis regarding attitudes and opinions of rural people of all status groups derived from a resident survey and an absentee landlord survey. Factual data on the size, distribution of land, ownership and land use, when combined with the attitudes and opinions recorded, become the basis for a tentative analysis of what direction land distribution policy might have to take to make suitable impacts on the rural population.

PB-190 131 HC A09 MF A01
 International Cooperation Administration, Manila (Philippines).

An Economic and Social Survey of Rural Households in Central Luzon.

Generoso F. Rivera, and Robert T. McMillan. Jun 54, 197p

Descriptors: *Philippines, *Economics, *Social sciences, Philippines, Agriculture, Employment, Wages, Population.

Identifiers: Land tenure, Luzon Island.

The report describes the size of farms; landlord-tenant relationships; income; expenses; capital; credit; employment; wages; and levels of living among 2,500 rural households of nine villages in high tenancy areas of central Luzon. Rapid population growth, an inequitable land tenure system, and lagging farm technology severely hinder agricultural and rural development. (AID abstract)

PB-190 674 HC A05 MF A01

Public Health Service, Washington, D.C. Office of International Health.

Community Water Supply in Developing Countries. A Quarter-Century of United States Assistance.

Frederick E. McNunkin. 1969, 95p
 Sponsored in part by Agency for International Development, Washington, D.C.

Descriptors: *Foreign aid, Water supplies, *Water supplies, Government(Foreign), Southeast Asia, Vietnam, Africa, Latin America.

Identifiers: Developing nations, South Vietnam.

The report discusses the role of water supply in developing countries; the highlights of AID efforts to improve community water supplies on a worldwide basis with brief reports on typical activities country-by-country, but grouped on a regional basis, i.e. Near East and South Asia, East Asia and Viet-Nam, Africa, and Latin America. (Author)

PB-190 675 HC A99 MF A01

Minnesota Univ., Minneapolis. Center for Comparative Political Analysis.

Bibliography on Planned Social Change (With Special Reference to Rural Development and Educational Development). Volume I. Periodical Literature.

Richard Blue, Robert T. Holt, John E. Turner, Richard Erikson, and David Garnham. 1 Jan 67, 693p.

See also Volume 2, PB-190 676.

Descriptors: *Sociometrics, Transformations, *Foreign aid, *Bibliographies, Abstracts, Rural areas, Economics, Agriculture, Education, Political science, Management planning, Attitudes, Africa, Asia, South America, Central America, West Indies, Pacific Ocean Islands, Europe, North America.

Identifiers: *Planned social change, Annotated bibliographies, *Foreign rural development, Developing countries.

The bibliography was prepared primarily to support the major research endeavors of the CIC-AID rural development research project. It is presented in preliminary form primarily for project use. Since a theoretical treatment of economic development in historical context and a specific analysis of a contemporary developing country are both relevant, the bibliography covers a wide range of materials. (Author)

PB-190 676 HC A10 MF A01

Minnesota Univ., Minneapolis. Center for Comparative Political Analysis.

Bibliography on Planned Social Change (With Special Reference to Rural Development and Educational Development). Volume II. Books and Book Length Monographs.

Richard Blue, Robert T. Holt, John E. Turner, Richard Erikson, and David Garnham. 1 Jan 67, 214p.

See also Volume 1, PB-190 675 and Volume 3, PB-190 677.

Descriptors: *Sociometrics, Transformations, *Foreign aid, *Bibliographies, Political science, Education, Agriculture, Economics, Africa, Asia, Europe, Latin America, Middle East, New Guinea, New Zealand, Management planning.

Identifiers: Annotated bibliographies, *Planned social change, Books, *Foreign rural development, Developing countries.

The document, the second volume in a 3 part report on planned social change in developing

SELECTED APPROPRIATE TECHNOLOGIES

countries, contains an annotated bibliography on foreign rural development.

PB-190 677 HC A09 MF A01
Minnesota Univ., Minneapolis. Center for Comparative Political Analysis.

Bibliography on Planned Social Change (With Special Reference to Rural Development and Educational Development). Volume III. Government Reports, U.N. Reports and Proceedings of Special Conferences.

Richard Blue, Robert T. Holt, John E. Turner, Richard Erikson, and David Garnham. 1 Jan 67, 196p*

See also Volume 1, PB-190 675.

Descriptors: *Sociometrics, Transformations, *Foreign aid, *Bibliographies, Economics, Agriculture, Education, Africa, Asia, Middle East, Latin America, Pacific Ocean Islands, Australia, New Zealand, Europe, North America.

Identifiers: Annotated bibliographies, *Planned social change, Foreign rural development, Developing countries.

The document, the third volume of a three part bibliography on planned social change in developing countries, contains government reports, UN reports, and proceedings of conferences on foreign rural development.

PB-191 034 HC A02 MF A01
Agency for International Development, Washington, D.C.

Urban Development, Including Housing.

1 Apr 70, 25p* Rept no. Development Administration-7

Descriptors: *Urban planning, *Bibliographies, *Housing, Foreign aid, Northern hemisphere, Southern hemisphere, Government(Foreign), Federal budgets, Reports, Reviews.

Identifiers: Annotated bibliographies, Developing countries.

An annotated bibliography is given, mainly of publications of the U.S. Agency for International Development in the field of urban development, including housing. Many of the publications were developed under contract to AID by the Office of International Affairs, U.S. Development of Housing and Urban Development.

PB-191 721 HC A02 MF A01
Central Piedmont Regional Council of Local Governments, N.C.

Citizen Participation.

Mar 70, 15p*

Sponsored in part by Department of Housing and Urban Development.

Descriptors: *Urban planning, *North Carolina, *Public opinion, Decision making, Management planning, Public relations, Organizations, Leadership, Questionnaires, Rural areas.

Identifiers: Minority groups, *Citizen planning participation, Central Piedmont region, Low income groups, *Regional planning, Counties.

The initial citizen participation element provides the means for determining the extent of present citizen participation in local public planning and decision-making throughout the region and for finding ways and means to strengthen and support meaningful citizen involvement from a regional planning point of view. (Author)

PB-192 431 HC A07 MF A01
Rensselaer County Dept. of Planning and Promotion, Troy, N.Y.

Water Supply and Sewage Disposal.

1968, 128p

Descriptors: *Management planning, New York, *Water supplies, Statistical analysis, *Sewage, Disposal, *Population, Volume, Costs, Analysis, Statistical data, Urban areas, Rural areas, Storms, Drainage, Maps.

Identifiers: *Rensselaer County(New York), *Area planning and development, *Cost analysis.

These facilities have been separately examined but are included in a single report. The section of water supply consists of a basic inventory of the existing water systems, their capacity, the number of people served, and the per capita consumption. Also presented is a cost analysis for each community serviced. The section on sewers includes an inventory of the existing sewers and storm water facilities and explanations of the districts proposed by the County, one of the towns, and by three of the villages. Appropriate maps and cost estimates for the new districts are also included. (Author)

PB-192 635 HC A04 MF A01
Texas A and M Univ., College Station. Water Resources Inst.

A Hydrometeorological Study Related to the Distribution of Precipitation and Runoff over Small Drainage Basins - Urban Versus Rural Areas.

Technical rept.

Robert G. Feddes, Robert A. Clark, and R. C. Runnels. Jun 70, 74p TR-28, OWRR-A-010-TEX(1)
Contract DI-14-01-0001-1864, DI-14-31-0001-3044

Descriptors: *Hydrology, Texas, *Atmospheric precipitation, Drainage, Urban areas, Rural areas, Storms, Floods, Rainfall, Correlation techniques, Rivers, Inland waterways, Mathematical prediction.

Identifiers: Bryan(Texas), Watersheds, Streamflow, Urbanization, Surface water runoff, Synthetic prediction of Hydrographs.

The effects of urbanization on streamflow are investigated for two adjacent similar watersheds located in and near Bryan, Texas. The Burton Creek watershed is 84 per cent urbanized and the Hudson Creek watershed is completely rural. Storms observed within each basin are used for comparison of pertinent hydrograph parameters. Simultaneous events are compared between the watersheds and the urbanization effect noted. A synthetic procedure for predicting hydrographs on both watersheds is developed. Reproduction of actual events indicates better results in the rural watershed. There is conclusive evidence that the urbanization of a watershed decreases time-to-peak and increases the peak discharge. (WRSIC abstract)

PB-192 726 HC A04 MF A01
Missouri Univ., Columbia. Dept. of Atmospheric Science.

Estimates of Potential Productivity from the Climatology of Solar Energy.

Final rept.

1 May 70, 67p
Grant Cwb-WBG-37

Descriptors: *Corn, Production, *Solar radiation, Agriculture, Photosynthesis, Sunspots, Attenuation, Scattering, Absorption, Heat flux, Atmosphere models, Water vapor, Cloud cover, Statistical data.

Identifiers: Solar flux.

The report deals with climatological evaluation and concerns an experimental study of the energy use by a corn canopy. (Author)

PB-192 750 HC A04 MF A01
Pennsylvania State Univ., University Park. Inst. for Research on Land and Water Resources.

Simplification of Integrated Stormwater Planning for Modern Multiple Land Use In Urban and Suburban Developments.

Project technical completion rept.
Brian M. Reich. 31 Mar 70, 62p* OWRR-B-010-PA(1)
Contract DI-14-01-0001-1046

Descriptors: *Hydrology, Management planning, *Storms, Drainage, *Urban areas, Drainage, Urban areas, Rural areas, Terrain, Floods, Control, Mathematical models, Programming(Computers), Storage, Dams, Deterrence, Design.

Identifiers: *Synthetic hydrographs, *Flood routing, Surface water runoff, Watersheds.

Four synthetic hydrograph methods were applied on five watersheds in hopes of simplifying planning decisions for reserved space in valley bottoms of suburbia headwaters. Both hydrograph and routing procedures were programmed for digital computer evaluation for the more than 300 cases considered. General conclusions include the following. (1) No simple rules can be given on width of floodways to planners. Each case must be individually investigated. (2) Computer methods greatly facilitate routing and synthetic hydrograph computations. (3) Generalizations are impossible because interactions occur between the method used, the return period, and the percentage of the watershed above the reservoir among others. (4) A great need exists for data-based methods for predicting suburban design hydrographs in ungauged situations. (5) A new course on urban hydrology was developed from the studies results. The course is designed to teach hydrologists the modern techniques which are being developed to solve this set of urban problems. (WRSIC abstract)

PB-192 794 HC A03 MF A01
Road Research Lab., Crowthorne (England).
Representative Rural Catchments In Kenya and Uganda.
D. Fiddes, and J. A. Forsgate. 1970, 35p Rept no. RRL-LR318

Descriptors: *Drainage, Subsaharan Africa, Rainfall, Networks, Containers, Terrain, Soils, Swamps, Fluid flow, Permeability, Hydraulic models, Floods, Storage, Rural areas, Kenya, Great Britain.

Identifiers: *Catchments, Surface water runoff, Culverts, Uganda.

The report describes networks of small rural catchments throughout Kenya and Uganda. The purpose of these is to provide data for the development of a design method for the estimation of waterway sizes for small bridges and culverts. The six catchments in each country are described. They have been sited to provide information on the effect on the runoff hydrograph of the following catchment parameters: (a) area, (b) spatial and temporal rainfall variability, (c) topography and soil type, (d) swamp. For each catchment a rainfall runoff correlation will be prepared, and unit hydrographs isolated. (Author)

PB-193 242 HC A11 MF A01
Massachusetts Inst. of Tech., Cambridge. Center for International Studies.

The Role of Popular Participation In Development.

Max F. Millikan, Lucian W. Pye, and David Haggard. Nov 68, 239p

Sponsored in part by Agency for International Development, Washington, D.C. Report of a Conference on the Implementation of Title IX of the Foreign Assistance Act, held at the Massachusetts Inst. of Tech., Endicott House, Dedham, Mass., 24 Jun to 2 Aug 68.

Descriptors: *Sociometrics, Foreign policy, *Foreign aid, Symposia, Organizations, Decision making, Attitudes, Social psychology, Personnel management, Training, Research program administration, Management planning, Department of Defense, Money.

Identifiers: *Economic development, *Developing countries, Management information systems, International relations.

The report summarizes the discussions, findings and recommendations of a six-week conference on foreign assistance. Half the participants were academic specialists and half were from AID staffs in Washington or in overseas missions. Chapters are devoted to the meaning of foreign assistance, foreign policy implications, AID and non AID instruments for implementing foreign assistance, assessment of programs, and suggested changes in organization, research, recruitment and training. (AID abstract)

PB-193 332 HC A04 MF A01
Capital District Regional Planning Commission, Albany, N.Y.
Sewer and Water Facilities Analysis.
Jul 70, 63p

SELECTED APPROPRIATE TECHNOLOGIES

Paper copy available from Capital District Regional Planning Commission, Barney Road Clubhouse, Clifton Knolls, El Dorado, N.Y. 12065.

Descriptors: *Management planning, Water supplies, *Water supplies, Statistical analysis, *Sanitary engineering, *New York, Rural areas, Sewage, Site selection, Dams, Wastes(Sanitary engineering), Disposal, Tables, Maps.

Identifiers: Area planning and development.

Inventory and analysis of both existing and planned public water systems and sewerage systems in the four-county region. The adequacy of water supply and sewerage planning in each county to qualify for initial HUD certification has been evaluated. Additional planning considerations are pointed out if the planning in any area is not adequate. Maps are developed to show the locations of existing and planned water and sewer facilities and the service area of each system. Pertinent data of each system are also collected and summarized in tables. (Author)

PB-193 553 MF A01
Economic Development Administration, Washington, D.C.

Formula for Growth: How to Make an Industrial Site Survey.

Oct 69, 30p

Paper copy available from Superintendent of Documents, GPO, Washington, D.C. 20402. \$0.30 as C48.8:IN2.

Descriptors: *Industries, *Site selection, *Urban areas, Industries, Terrain, Factor analysis, Urban planning, Rural areas, Mapping, Aerial photographs, Roads, Water supplies, Sanitary engineering, Hydrology, Law, Handbooks.

Identifiers: *Industrial sites, Economic development, Area planning and development, Zoning, Tax rates.

A firm seeking a location for a new plant needs a site ideal for both present use and future expansion. To back its efforts to attract new industry, a local economic development organization must be fully prepared to supply information on individual plant sites in the area and to point out the unique advantages of each site. The guide explains how to identify sites ideal for industry and how to assemble this information for use in attracting new and expanding companies.

PB-194 368 HC A09 MF A01
Kansas Dept. of Economic Development.

A Design Study on the Economic Use of Agricultural Wastes In Kansas.

Kansas planning for development.

Jan 69, 183p* Rept no. 25

Prepared in cooperation with Theracon, Inc., Topeka, Kans. and Kansas Economic Development Commission.

Descriptors: *Agricultural wastes, Utilization, *Waste disposal, Effectiveness, *Economic development, *Kansas, Management planning, Benefit cost analysis, Research projects, Environmental engineering, Water pollution, Control.

The report represents a study of agricultural wastes in Kansas and the technology available for economic utilization. The principal wastes that may provide raw materials for profitable utilization are identified and data on location and quantity of each waste are presented. The most important agricultural waste in Kansas comes from large cattle feedlots. Since disposal is costly to the cattle feeding industry utilization technology is sought to provide raw material for economic development. (Author)

PB-194 391 HC A03 MF A01
Ernst and Ernst, Washington, D.C.

Study of Raw Material Costs for a Proposed Straw-Based Pulping Mill In the Vicinity of Mobridge, South Dakota.

Aug 70, 36p EDACCOMM-70-001

Contract C-9-35084

Descriptors: *Pulp mills, *Cost estimates, *Economic development, *South Carolina, Corrugating,

Straw, Waste papers, Employment, Pulping, Feasibility.

Identifiers: Straw based pulping, *Technical assistance, Mobridge(South Dakota).

The concept of establishing a mill to manufacture corrugating medium on land owned by the Standing Rock Sioux Indian Tribe in the vicinity of Mobridge, South Dakota has been to take advantage of one of the area's abundant and relatively little-used resources, wheat straw, as a principal ingredient. The specific purpose of this study was to: (1) determine the availability of sufficient straw to support the proposed mill; (2) to determine various cost elements attendant to the collection and storage of straw and the availability and procurement costs of the other principal ingredient of the mill's output - waste paper. (Author)

PB-194 589 HC A03 MF A01

Bureau of Reclamation, Denver, Colo. Office of Chief Engineer.

Annual Report of Phreatophyte Activities-1968.

Technical rept.

Philip M. Turner. Jul 70, 29p Rept no. REC-OCE-70-27

Descriptors: *Phreatophytes, Control, *Herbicides, Phreatophytes, Weed control, Spraying, Agricultural machinery, Evaporation, Evapotranspiration, Soil water, Water conservation, Semiarid land, Arizona, Nevada, Colorado, New Mexico.

Bureau of Reclamation activities on phreatophyte research and control are described. Regional research contracts have been negotiated with universities in Arizona and Nevada. At Denver, Colo., saltcedar plants are greenhouse- and nursery-cultured and used as test specimens for foliar-applied herbicides. Herbicides are evaluated on saltcedar in plots along the Arkansas River near North Avondale, Colo. Helicopter herbicide spraying was performed on 920 acres (372 ha) of saltcedar at Rye Patch Reservoir by the Bureau of the Pershing County Water Conservation District. 14,000 acres (5,667 ha) of phreatophytes have been removed from the Colorado Indian Reservation near Parker, Ariz., since 1965. Phreatophytes have been controlled by tree crusher, root plow, cutter dozer, and spraying on 38,600 acres (15,645 ha) along the Pecos River in New Mexico. (Author)

PB-194 757 HC A06 MF A01

California State Dept. of Housing and Community Development, Sacramento.

Demonstration In Low-Cost Housing Techniques.

Final rept.

Charles R. LeMenager, Ed Bowe, and Dean C. Hill. Jun 70, 110p*

Contract HUD-H-650

Descriptors: *Residential buildings, *California, *Rural areas, Residential buildings, Construction management, Cost analysis, Construction materials, Drawings, Evaluation, Factor analysis, Statistical data, Time.

Identifiers: Low cost housing, Demonstration projects.

The low income housing demonstration project is part of the search for means of developing housing to be utilized for low income domestic and often migratory farm workers in the western states. The objective was to study methods of construction, building materials and supplies, and building plans in three California areas which would produce inexpensive housing. A total of 28 units were built using a variety of construction techniques. Studies of the units and their occupants have been made and the results are recorded. The report reflects building costs and building construction features, as well as the amenities or undesirable features of these structures as seen through the eyes of professional building evaluators, housing authority officials, and the residents themselves. (Author)

PB-195 052 HC A08 MF A01

Bureau of Commercial Fisheries, Ann Arbor, Mich.

Evaluation of an Experimental Fish Reduction Process Applicable to Small Fisheries.

Jul 70, 165p* EDACCOMM-70-012

Descriptors: *Economic development, Fisheries, *Fresh water fishes, Processing, Aquatic animals, Pesticides, Removal, Cost analysis, Feeding stuffs, Animal nutrition, Production capacity, Market research.

Identifiers: *Mink industry, Fishcare, Pressfish, Technical assistance projects.

The study is concerned with use of freshwater fish for mink food. Feeding trials with presscake are described. Recommendations indicate that presscake offers considerable promise in the mink industry. Additional research is recommended. An implementation program makes technical assistance available to anyone showing interest in production or use of presscake. (BCF abstract).

PB-195 226 HC A10 MF A01

Massachusetts Inst. of Tech., Cambridge.

The Economics of Fish Protein Concentrate.

Sep 70, 202p* MSC-71-69

Descriptors: *Fish protein concentrates, *Economic analysis, *Developing countries, Fish protein concentrates, Cost estimates, Nutritive value, Food habits, International trade, Chile, Capital, Infant nutrition, Fishing.

The report examines the economic feasibility of fish protein concentrate (FPC) in two contexts: (1) As a nutritional supplement in the diet of a developing country; and (2) as a competitive food additive in the United States. These subjects are examined with special reference to the role that the United States Government should play in the development of FPC. The Report recommends that: Efforts to tie the FPC program to the domestic fisheries should be resisted; a reasoned, broadbased program of research into the basic technology of FPC is one of the better investments that the U.S. could presently make, and that such a program should be supported and strengthened; and the Aberdeen, Washington pilot scale FPC processing plant should be developed into a flexible, pilot scale testing center for a variety of processes and combinations of processes. A bibliography of 113 references is included. (Author)

PB-195 291 HC A18 MF A01

Charles River Associates, Inc., Cambridge, Mass.
Choice of Transport Technology under Varying Factor Endowments In Less Developed Countries.

Final rept. 30 Jan 69-30 Jun 70

Paul Roberts. Jun 70, 409p* Rept no. CRA-3-138-30

Contract DOT-OS-A9-003

See also PB-195 292 and PB-195 293.

Descriptors: *Transportation, *Developing countries, *Economic development, Transportation, *Project planning, Transportation, Economic analysis, Management methods, Highway transportation, Rail transportation, Factor analysis, Substitutes, Benefit cost analysis, Traffic engineering, Transportation models, Air transportation.

Identifiers: Technology.

The study was undertaken to assist developing countries in making economically rational choices in transport technologies--and thus to assist in their economic development and eventually to reduce the need for external capital assistance. The study uses cost simulation models for road, rail and air transport modes to develop guidelines for planners, taking account of the varying conditions of factor endowments (i.e., availabilities of labor, capital, and other resources) in the developing countries. Investment decisions involving choice of technology and mode may be expected to be sensitive to differences in prices of inputs. The sample problems of the report concern: A comparison of investment in a new rail facility and in a new road to serve a route between two traffic centers (nodes); and an evaluation of the various trade-offs involving vehicle technology and airport investment. (DOT abstract)

SELECTED APPROPRIATE TECHNOLOGIES

- PB-195 315** HC A12 MF A01
 Agency for International Development, Washington, D.C.
- A.I.D. Spring Review of Land Reform. Volume I. Land Reform In India.**
 Country papers, 2nd ed.
 Gene Wunderlich, Walter C. Neale, F. Tomasson Jannuzzi, and Ronald G. Ridker. Jun 70, 268p* Rept nos. SR/LR/C-20, SR/LR/C-21
 Also includes Rept. no. SR/LR/C-22, SR/LR/B-4. See also Volume 2, PB-195 316.
- Descriptors: *Land, *Government policies, *Economic development, *India, Legislation, Land titles, Economic surveys, Demography, Sociometrics, Agriculture, Foreign aid, Revisions, Urbanization.
 Identifiers: Land laws, *Land reform.
- The document on India is one of a series which covers most nations that have experienced or are considering land reform. The design for each paper is the same: the situation before reform, the reform program, and the effects of the program. (AID abstract)
- PB-195 316** HC A12 MF A01
 Agency for International Development, Washington, D.C.
- A.I.D. Spring Review of Land Reform. Volume II. Land Reform In Iran, Iraq, Pakistan, Turkey, Indonesia.**
 Country papers, 2nd ed.
 Kenneth B. Platt, H. Charles Treakle, Charles M. Elkington, Edwin J. Cohn, and E. Utrecht. Jun 70, 273p* Rept nos. SR/LR/C-18, SR/LR/C-19
 Also includes Rept. no. SR/LR/C-30. See also Volume 3, PB-195 317.
- Descriptors: *Land, *Middle East, *Economic development, Asia, *Iran, *Economic development, *Iraq, *Economic development, *Indonesia, *Economic development, *Pakistan, *Economic development, *Turkey, *Economic development, Economic surveys, Demography, Sociometrics, Revisions, Legislation, Land titles, Agriculture, Developing countries, Urbanization.
 Identifiers: Land laws, *Land reform.
- The document on Iran, Iraq, Pakistan, Turkey and Indonesia is one of a series covering most nations that have experienced or are considering land reform. The design for each country paper is the same: the situation before reform, the reform program, and the effects of the program. (AID abstract)
- PB-195 317** HC A14 MF A01
 Agency for International Development, Washington, D.C.
- A.I.D. Spring Review of Land Reform. Volume III. Land Reform In Japan, South Korea, Taiwan.**
 Country papers, 2nd ed.
 Harold E. Voelkner, Robert B. Morrow, Kenneth H. Sherper, and Anthony Y. C. Koo. Jun 70, 315p* Rept nos. SR/LR/C-23, SR/LR/C-24
 Also includes Rept. no. SR/LR/C-25. See also Volume 4, PB-195 318.
- Descriptors: *Land, *Government policies, *Economic development, Far East, *Japan, *Economic development, *South Korea, *Economic development, *Taiwan, *Economic development, Legislation, Land titles, Economic surveys, Demography, Sociometrics, Agriculture, Revisions, Foreign aid, Urbanization.
 Identifiers: Land laws, *Land reform.
- The document on Japan, South Korea, and Taiwan is one of a series which covers most nations that have experienced or are considering land reform. The design for each country paper is the same: the situation before reform, the reform program, and the effects of the program. (AID abstract)
- PB-195 318** HC A14 MF A01
 Agency for International Development, Washington, D.C.
- A.I.D. Spring Review of Land Reform. Volume IV. Land Reform In the Philippines, North Vietnam, South Vietnam.**
 Country papers, 2nd ed.
 Harold D. Koone, Lewis E. Gleck, Christine Pelzer White, and MacDonald Salter. Jun 70, 304p* Rept nos. SR/LR/C-26, SR/LR/C-27
 Also includes Rept. no. SR/LR/C-28. See also Volume 5, PB-195 319.
- Descriptors: *Land, *Government policies, *Economic development, Southeast Asia, *Philippines, *Economic development, *North Vietnam, *Economic development, *South Vietnam, *Economic development, Legislation, Land titles, Economic surveys, Agriculture, Demography, Sociometrics, Revisions, Foreign aid, Urbanization.
 Identifiers: Land laws, *Land reform.
- The document on the Philippines, North Vietnam, and South Vietnam is one of a series covering most nations that have experienced or are considering land reform. The design for each country paper is the same: the situation before reform, the reform program, and the effects of the program. (AID abstract)
- PB-195 319** HC A11 MF A01
 Agency for International Development, Washington, D.C.
- A.I.D. Spring Review of Land Reform. Volume V. Land Reform In Chile, Colombia, Venezuela.**
 Country papers, 2nd ed.
 William C. Thiesenhausen, Herman Felstheusen, and Harry E. Wing, Jr. Jun 70, 232p* Rept nos. SR/LR/C-8, SR/LR/C-31
 Also includes Rept. no. SR/LR/C-4, SR/LR/C-3. See also Volume 6, PB-195 320.
- Descriptors: *Land, *Government policies, *Economic development, South America, *Chile, *Economic development, *Colombia, *Economic development, *Venezuela, *Economic development, Legislation, Land titles, Economic surveys, Agriculture, Demography, Sociometrics, Revisions, Foreign aid, Urbanization.
 Identifiers: Land laws, *Land reform.
- The document on Chile, Colombia and Venezuela is one of a series which covers most nations that have experienced or are considering land reform. The design for each country paper is the same: the situation before reform, the reform program, and the effects of the program. (AID abstract)
- PB-195 320** HC A13 MF A01
 Agency for International Development, Washington, D.C.
- A.I.D. Spring Review of Land Reform. Volume VI. Land Reform In Bolivia, Ecuador, Peru.**
 Country papers, 2nd ed.
 Ronald James Clark, and Thomas F. Carroll. Jun 70, 280p* Rept nos. SR/LR/C-7, SR/LR/C-5
 Also includes Rept. no. SR/LR/C-6. See also Volume 7, PB-195 321.
- Descriptors: *Land, *Government policies, *Economic development, South America, *Bolivia, *Economic development, *Ecuador, *Economic development, *Peru, *Economic development, Legislation, Land titles, Economic surveys, Agriculture, Demography, Sociometrics, Revisions, Foreign aid, Urbanization.
 Identifiers: Land laws, *Land reform.
- The document on Bolivia, Ecuador, and Peru is one of a series which covers most nations that have experienced or are considering land reform. The design for each country paper is the same: the situation before reform, the reform program, and the effects of the program. (AID abstract)
- PB-195 321** HC A13 MF A01
 Agency for International Development, Washington, D.C.
- A.I.D. Spring Review of Land Reform. Volume VII. Land Reform In Brazil, Northeast Cuba, Guatemala, Mexico.**
 Country papers, 2nd ed.
 Antonio Gayoso, and Folke Dovring. Jun 70, 296p* Rept nos. SR/LR/C-9, SR/LR/C-29
- Descriptors: *Land, *Government policies, *Economic development, Europe, *Hungary, *Economic development, *Italy, *Economic development, *Yugoslavia, *Economic development, Revisions, De-
- Also includes Rept. nos. SR/LR/C-2, SR/LR/C-1. See also Volume 8, PB-195 322.
- Descriptors: *Land, *Government policies, *Economic development, Latin America, *Brazil, *Economic development, *Guatemala, *Economic development, *Mexico, *Economic development, Economic surveys, Agriculture, Demography, Sociometrics, Legislation, Foreign aid, Land titles, Urbanization.
 Identifiers: Land laws, *Land reform.
- The document on Northeast Brazil, Mexico, Cuba, and Guatemala is one of a series which covers most nations that have experienced or are considering land reform. The design for each country paper is the same: the situation before reform, the reform program, and the effects of the program. (AID abstract)
- PB-195 322** HC A13 MF A01
 Agency for International Development, Washington, D.C.
- A.I.D. Spring Review of Land Reform. Volume VIII. Land Reform In Algeria, Tunisia, the United Arab Republic.**
 Country papers, 2nd ed.
 Phillips W. Foster, John L. Simmons, and Kenneth B. Platt. Jun 70, 278p* Rept nos. SR/LR/C-13, SR/LR/C-14
 Also includes Rept. no. SR/LR/C-17. See also Volume 9, PB-195 323.
- Descriptors: *Land, Government policies, *Economic development, North Africa, *Algeria, *Economic development, *Tunisia, *Economic development, *United Arab Republic, *Economic development, Legislation, Land titles, Economic surveys, Agriculture, Urbanization, Demography, Sociometrics, Revisions, Foreign aid.
 Identifiers: Land laws, *Land reform.
- The document on Algeria, Tunisia, and the UAR is one of a series which covers most nations that have experienced or are considering land reform. The design for each country paper is the same: the situation before reform, the reform program, and the effects of the program. (AID abstract)
- PB-195 323** HC A07 MF A01
 Agency for International Development, Washington, D.C.
- A.I.D. Spring Review of Land Reform. Volume IX. Land Reform In Kenya. The Land Tenure Problem In Nigeria.**
 Country papers, 2nd ed.
 Barbara K. Herz, and Kenneth H. Parsons. Jun 70, 135p* Rept nos. SR/LR/C-16, SR/LR/C-15
 See also Volume 10, PB-195 324.
- Descriptors: *Land, Government policies, *Economic development, Subsaharan Africa, *Kenya, *Nigeria, *Economic development, Legislation, Land titles, Economic surveys, Agriculture, Urbanization, Sociometrics, Revisions, Foreign aid.
 Identifiers: Land laws, *Land reform.
- The document on Kenya and Nigeria is one of a series which covers most nations that have experienced or are considering land reform. The design for each country paper is the same: the situation before reform, the reform program, and the effects of the program. (AID abstract)
- PB-195 324** HC A12 MF A01
 Agency for International Development, Washington, D.C.
- A.I.D. Spring Review of Land Reform. Volume X. Land Reform In Hungary, Italy, Yugoslavia. Regional Surveys.**
 Country papers, 2nd ed.
 Folke Dovring, Davis McEntire, and Edward B. Rice. Jun 70, 256p* Rept nos. SR/LR/C-10, SR/LR/C-12
 Also includes Rept. nos. SR/LR/C-11, SR/LR/C-32. See also Volume 11, PB-195 325.
- Descriptors: *Land, Government policies, *Economic development, Europe, *Hungary, *Economic development, *Italy, *Economic development, *Yugoslavia, *Economic development, Revisions, De-

SELECTED APPROPRIATE TECHNOLOGIES

veloping countries, Legislation, Land titles, Urbanization, Sociometrics, Foreign aid.
Identifiers: Land laws, *Land reform.

The document on Hungary, Italy and Yugoslavia, regional surveys is one of a series covering most nations that have experienced or are considering land reform. The design for each country paper is the same: the situation before reform, the reform program, and the effects of the program. (AID abstract)

PB-195 325 HC A16 MF A01
Agency for International Development, Washington, D.C.

A.I.D. Spring Review of Land Reform. Volume XI. Analytical Papers.

Country papers, 2nd ed.

Jun 70, 372p* Rept no. SR/LR/A-1

Also includes Rept. nos. SR/LR/A-2,3,4,5,6,7,8,9,10,11,12. See also Volume 12, PB-195 326.

Descriptors: *Land, Government policies, *Foreign government, Management planning, *Surveys, Developing countries, Agricultural economics, Political science, Land surveys, Financing, Credit, Residential buildings, Demography, Farm management, Urbanization, Europe.
Identifiers: Land laws, *Land reform.

The document is one of a series which covers most nations that have experienced or are considering land reform in Hungary, Italy and Yugoslavia. The design for each country paper is the same: the situation before reform, the reform program, and the effects of the program. The country papers are the basic source of information for the Analytical Papers. (AID abstract)

PB-195 326 HC A10 MF A01
Agency for International Development, Washington, D.C.

A.I.D. Spring Review of Land Reform. Volume XII. Background Papers.

Country papers, 2nd ed.

Jun 70, 220p* Rept no. SR/LR/B-1

Also includes Rept. nos. SR/LR/B-2,3,4,5,6,7. See also Volume 1, PB-195 315.

Descriptors: *Land, Developing countries, *Foreign government, Management planning, *Economic development, Technical reports, Foreign aid, Opinions, Economic surveys, Rural areas, Agriculture, Theories, Mathematical models, Latin America, India, Asia, Europe, Africa.
Identifiers: Poverty, Land laws, *Land reform.

The document is one of a series which covers most nations in Latin America, Asia, Europe, and Africa that have experienced or are considering land reform. The design for each country paper is the same: the situation before reform, the reform program, and the effects of the program. The volume contains background studies. (AID abstract)

PB-195 597 PC A10 MF A01
California Univ., Berkeley, Inst. of Transportation and Traffic Engineering.

Opportunities for Cost Reduction in the Design of Transport Facilities for Developing Regions. Volume I.

Mar 70, 220p

Contract DOT-OS-A9-004

See also Volume 2, PB-195 598.

Descriptors: *Transportation, *Developing countries, *Highways, Cost engineering, Design standards, Economic analysis, Construction, Mathematical models, Savings, Highway bridges, Culverts, Ferryboats, Foreign aid.
Identifiers: Fords(Water crossings).

The study explores the problem of the selection of low-cost technologies for provision of transportation in developing countries. It surveys the range of technologies that might be used, investigates analytical approaches, and suggests based for selecting among resource and cost alternatives. Volume I discusses at length various problems relating to technologic choice in the field of road transport.

Among the problems treated are the development of cost functions, design standards, pavement type, water crossings, one-lane bridging, and vehicle types. Statistical tables graphics, and lists of references appear at the end of the chapter when appropriate. (Author)

PB-195 598 PC A10 MF A01
California Univ., Berkeley, Inst. of Transportation and Traffic Engineering.

Opportunities for Cost Reduction in the Design of Transport Facilities for Developing Regions. Volume 2.

Mar 70, 221p*

Contract DOT-OS-A9-004

See also Volume 1, PB-195 597.

Descriptors: *Transportation, *Developing countries, *Cost engineering, Transportation, Cost control, Foreign aid, Air transportation, Waterway transportation, Ground vehicles, Investments, Economic models.

Identifiers: *Transport technology, Investment models.

The study explores the problem of the selection of low-cost technologies for provision of transportation in developing countries. It surveys the range of technologies that might be used, investigates analytical approaches, and suggests bases for selecting among resource and cost alternatives. The chapters comprising the second of two volumes discuss potential cost savings in the design and use of ground vehicles; reduction of cost in aircraft, airports and airways; savings in the selection of waterway and harbor techniques; and economic models for the choice of levels of transport investment. (Author)

PB-195 677/0 PC A06/MF A01
Westinghouse Ocean Research Lab., San Diego, Calif.

Biological Effects of Effluent from a Desalination Plant at Key West, Florida

Water pollution control series

W. D. Clarke, J. W. Joy, and R. J. Rosenthal. Feb 70, 103p FWQA-18080-DAI-02/70

Contract FWQA-14-12-470

Paper copy available from Superintendent of Documents, GPO, Washington, D. C. 20402. \$1.00 as 167.13/4:18050DAI-02/70.

Descriptors: *Aquatic biology, Ecology, *Ecology, *Effluents, *Salinity, Aquatic biology, *Desalting, Water pollution, Biomass, Environments, Florida, Tropical regions, Aquatic animals, Aquatic plants, Heat.

Identifiers: *Desalination plants, *Thermal pollution, Key West(Florida).

The Key West study was undertaken to determine the impact of the discharge from a large desalting plant on the surrounding environment. The Phase-I work has shown that some of the properties of the effluent can be detected by physical and chemical measurements well beyond the area that visible effects can be detected in the bottom communities. While the effluent produces some beneficial effects such as attracting certain species of fish and the stone crab, Menippe mercenaria, it has also been shown to have deleterious effects for other organisms. Algae, tunicates, and gastropods were excluded from the near-field of the effluent discharge and bryozoan colonies were not as numerous in the discharge area nor did they grow as well as they did outside of the area. Quantitative investigations of the physiological and ecological effects of the desalting plant effluent in future studies could lead to predictive capabilities as far as the amount of environmental stress that can be tolerated at a given locality. (Author)

PB-195 900 PC A02 MF A01
Alabama Agricultural Experiment Station, Auburn.

Report of Fishcultural Investigations in the Federation of Malaysia. Increasing Fish Production by Improved Fishcultures, Phase I.

H. S. Swingle, and D. D. Moss. 15 Aug 69, 18p Contract AID/csd-1581

Revision of report dated 26 Feb 68.

Descriptors: *Aquaculture, *Malaysia, *Fisheries, Surveys, Fresh water fishes, Research, Personnel, Laboratories.

Identifiers: Tropical fish culture.

The report surveys the Fisheries Department of the Ministry of Agriculture which operates three marine stations and seven freshwater fish hatcheries. It covers the physical plant, water supply, facilities, staff and major research projects of the Tropical Fish Culture Research Station at Malacca, which is not part of the Fisheries Department. It discusses the problems involved in the future operation of the research station. (Author)

PB-195 913 PC A07 MF A01
General Oceanology, Inc., Cambridge, Mass.

Commercial Feasibility of Fish Protein Concentrate in Developing Countries. Volume I. The Protein Situation in Korea and the Potential Role for Fish Protein Concentrate.

Final rept.

Oct 69, 145p Rept no. GO-8

Contract AID/csd-2158

Prepared in cooperation with the American Technical Assistance Corp., and Sidney M. Cantor Associates, Inc.

Descriptors: *Fish protein concentrates, *South Korea, *Proteins, South Korea, *Developing countries, *Food, Feasibility, Nutritive value, Nutritional deficiencies, Food deprivation, Cost effectiveness, Food processing.

The report establishes that protein malnutrition exists in certain groups in Korea, and that fish protein concentrate (FPC) might contribute to ameliorating this shortage. Present economics and raw material shortages, however, mitigate against a self-priming commercial FPC operation in Korea today. However, some alternative paths for protein relief through FPC are possible. The report reviews protein nutrition, and the Korean protein system, and calculates the 'protein gap' for the groups and determines the cost/effectiveness of protein fortification. It examines the feasibility of producing FPC locally, the implications of a protein supplement program on national nutrition policies and the cost of closing the protein gap. (Author)

PB-196 296 PC A20 MF A01
Agency for International Development, Washington, D.C.

Marketing Stable Food Crops In Sierra Leone.

Rept. for Mar 66-Jun 67.

1967, 474p

Descriptors: *Farm crops, *Sierra Leone, *Food, Marketing, Economic development, Vegetable oils, Nuts(Fruits), Root crops, Rice, Production, Consumption, Processing, Labor relations, Statistical data, Prices, Cost engineering.

Identifiers: Palm oil, Ground nuts, Cassava, Retail trade, Wholesale trade.

The document covers the general economic environment in which the marketing system of Sierra Leone operates, how the market system is organized and how it functions, price changes over time and between areas, marketing costs, and ways of improving the marketing system so that it will contribute more effectively to the economic development of the country. Special attention is given to the marketing of rice, palm oil, groundnuts and cassava. (AID abstract)

PB-196 306 PC A03 MF A01
Texas Tech Univ., Lubbock, Dept. of Agricultural Engineering.

Artificial Recharge In Water Resources Management.

Marvin J. Dvoracek, and Sam H. Peterson. 1970, 29p OWRR-B-041-TEX(4)

Descriptors: *Ground water recharge, Water supply, *Water supply, Arid land, *Water resources, Management planning, Water conservation, Recharge wells, Semiarid land, Irrigation, Agriculture, Ground water, Sediments, Economic factors, Texas.

Identifiers: Ogallala formation, *Artificial recharge.

SELECTED APPROPRIATE TECHNOLOGIES

Water resources for arid and semiarid regions of the United States are only marginal at the present time and new sources of water are no longer available. Artificial recharge techniques are presented as one method of partially alleviating the problem. Artificial recharge is presented in the context of the water depletion of the Ogallala formation on the High Plains of Texas. There, as in the United States as a whole, irrigated agriculture is the major water user. Several recharge mechanisms are discussed, such as recharge wells, shafts, holes, pits, trenches, rubble cones, and water spreading. All of the methods share the problem of sediment content in water used for recharge, but the problem is not insurmountable. In some cases economic value of artificially recharged water has already outweighed the limitations. (WRSIC-abstract)

PB-196 312 PC E01 MF A01
Hawaii Univ., Honolulu. Water Resources Research Center.

Relative Toxicities of Selected Chemicals to Several Species of Tropical Fish.

Technical rept. 1 Jul 69-30 Jun 70
Jerry H. Nunogawa, Nathan C. Burbank, Jr., Reginald H. F. Young, and L. Stephen Lau. Aug 70, 44 TR-40, OWRR-A-018-HI(1)
Contract DI-14-31-0001-3011

Descriptors: *Pesticides, *Toxicity, *Water pollution, Pesticides, *Insecticides, Water pollution, *Fishes, Pesticides, Toxicity, Bioassay, Water quality, Effectiveness, Tropical regions, Tolerances(Physiology), Streams, Estuaries, Phenol, DDT, Dieldrin, Chlorobenzenes, Lindane. Identifiers: *Tropical fish, Gambusia affinis, Lebiasina reticulata, Tilapia mossambica, Kuhlia sandvicensis, Stolephorus purpureus, Mosquito fish, Guppies, Aholehole, Nahu. (Author)

This study determined the 24, 48, 96-hour median tolerance limit of phenol, DDT, dieldrin, and lindane of five species of fish commonly found in streams and estuaries in semi-tropical areas. They are: i) Gambusia affinis - mosquito fish, (ii) Lebiasina reticulata - guppies, (iii) Tilapia mossambica - tilapia, (iv) Kuhlia sandvicensis aholehole, and (v) Stolephorus purpureus - nahu. Of the five species, Gambusia affinis had the highest tolerance to the toxic agents used in this study. Lebiasina reticulata and Tilapia mossambica had approximately the same sensitivity to DDT as well as dieldrin and lindane. Lebiasina reticulata had a higher sensitivity to phenol than Tilapia mossambica. Although Stolephorus purpureus, nahu, was highly sensitive, Kuhlia sandvicensis was most sensitive to all toxic agents used. (Author)

PB-196 340 PC A03 MF A01
 Battelle Memorial Inst., Columbus, Ohio. Columbus Labs.

The Continued Development and Field Evaluation of the Aid Hand-Operated Water Pump.

Final rept.
R. D. Fannon, Jr., and D. W. Frink. 28 Aug 70, 42p
Contract AID/csd-2174

Descriptors: *Piston pumps, Design, *Well pumps, Water distribution, *Developing countries, Well pumps, Plungers, Valves, Bushings, Materials, Cost estimates. Identifiers: Hand operated piston pumps.

The document based on research carried out over a period of several years on the development of a simple, efficient, hand-operated piston pump for use in developing countries. It covers plunger-valve design, selection of optimum cup material, and the evaluation of cylinder coatings, foot valves, and handle pins and bushings. (AID abstract)

PB-196 341 PC A05 MF A01
Joint Development Group, Saigon (Republic of Vietnam).

Present Situation and Possibilities of Postwar Development of Inland-Fisheries in the Mekong delta.

Nov 68, 96p Rept no. Working Paper-42

Contract AID/fe-291

Descriptors: *Aquaculture, *Vietnam, *Economic development, Fisheries, Fishing grounds, Hydrographic surveys, Ichthyosis, Rivers, Food processing, Agriculture, Fisheries. Identifiers: Mekong River, Mekong Delta, Fish marketing, South Vietnam.

The report describes the hydrographical and ichthyological features of the Mekong. Discusses the different methods of exploitation of natural water bodies and ponds, the processing and stocking of fishery products, the transportation and marketing aspects. Recommends the increase of fishing production to keep pace with population growth, raising the income of rural people, and strengthening the agricultural economy. Analyzes the interaction and integration of fisheries activities in the post-war development program. Appendices include a list of fish species in river and flooded areas of SVN and a check list of fish-culture species cultivated in SVN. A one-page bibliography is included. (Author)

PB-196 352 PC A04 MF A01
Joint Development Group, Saigon (Republic of Vietnam).

A Description of Ocean Fish Marketing in Saigon.

Report for May-Jun 68
Nguyen Van Thuan, Nguyen Cao Dan, and Larry L. Pressler. Jun 68, 62p Rept no. Working Paper-24
Contract AID/fe-291

Descriptors: *Marine fishes, Marketing, *Economic surveys, *South Vietnam, Commerce, Seafood, Cost engineering, Transportation, Cooperation, Interviews, Personnel, Economic development. Identifiers: Saigon(South Vietnam), Wholesale trade, Retail trade, Cooperatives.

The report outlines the marketing aspects of ocean fish in the Saigon-Cholon urban complex based on four weeks of research visiting wholesale and retail markets, and interviews with dealers, boatowners, truckowners, police and consumers. It includes data on pricing, operations of wholesalers, transportation costs and retailers. Appendices contain information on the fishing cooperatives at Rach Gia and Ham Tan. (AID abstract)

PB-197 104 HC A03 MF A01
Agency for International Development, Washington, D.C.

A.I.D. Spring Review of Land Reform, June 2-4, 1970. Findings and Implications for a.i.d.

Elizabeth Carter. Dec 70, 33p Rept no. AID-SR/LR-70-13
See also Volume 12, PB-195 326.

Descriptors: *Land, Management, *Developing countries, Policies, *Counseling, Effectiveness, Meetings, Reviews, Distribution theory, Political objectives, South Asia, North Africa, Middle East, Latin America, Cost analysis, Japan. Identifiers: *Land reform, Alternatives.

The paper contains findings and implications deriving from A.I.D.'s Spring Review of Land Reform, 1970. The findings are: there is a clear economic case for land reform; both the political will and political capacity for land reform are critical; land reform is likely to be politically stabilizing over the long run; urbanization is not an adequate alternative to land reform; colonization has not been a viable alternative to land reform; complementary measures are important for a reform's success. The implications are: land tenure is a significant dimension in overall development; support of land reform need not be withheld for fear of adverse economic results; where a dominant political will is lacking A.I.D. should take careful cognizance of what probable effects its assistance program may have on either prolonging or ameliorating existing inequities in land tenure; A.I.D. should not support a land reform which is basically just window dressing; external assistance may be constructively applied on many aspects of the reform; the question of how and when a land reform should be carried out must be determined by each individual country; these findings and implications point clearly to A.I.D. staffing needs. (Author)

PB-197 157

PC A10 MF A01

Massachusetts Inst. of Tech., Cambridge. Sea Grant Project Office.

The Economics of Fish Protein Concentrate.
J. W. III Devaney, and G. Mahnken. 20 Nov 70, 202p * Rept no. MITSG-71-3

Descriptors: *Fish protein concentrates, Economics, *Nutrition, *Developing countries, Feasibility, Econometrics, Benefit cost analysis, Cost effectiveness, Chile, Standards, Requirements, Analysis of variance. Identifiers: Sea Grant program.

The report examines the economic feasibility of fish protein concentrate in two contexts: as a nutritional supplement in the diet of a developing country, and as a competitive food additive in the United States. The report examines the subject with special reference to the role that the United States Government should play in the development of FPC. Fish protein concentrate designates any stable powder resulting from the removal of oil and water from fish which is aimed at human consumption. When we are referring to a particular variety of FPC, we will attempt to make this specialization clear either explicitly or by the context.

PB-197 758

PC A09 MF A01

Greenleigh Associates, Inc., New York.
An Evaluation of Consumer Action and Urban Cooperative Programs. Volume I: Summary of Findings.

Final rept. 1 Jun 69-31 Sep 70.
Feb 71, 185p * OEO-LN-862
Contract OEO-B99-4873
See also Volume 2, PB-197 759.

Descriptors: *Purchasing, Coordinated procurement, *Consumers, Economic factors, Cooperation, Financing, Project planning, Economic development, Marketing, Credit, Evaluation.

Identifiers: Low income consumers, Credit unions, Cooperatives, *Consumer's cooperatives, Marketing cooperatives, Buying clubs, Small markets cooperatives, Cooperative enterprises, Service cooperatives.

The report presents a study to determine the effectiveness of OEO's Consumer Action and Urban Cooperative Program. The goals of this program were to aid low-income consumers through the establishment of cooperatives and credit unions and to encourage the involvement of outside capital in economic enterprises. (OEO abstract)

PB-197 759

PC A12 MF A01

Greenleigh Associates, Inc., New York.
An Evaluation of Consumer Action and Urban Cooperative Programs. Volume II: Individual Project Reports.

Final rept. 1 Jun 69-31 Sep 70.
Feb 71, 269p * OEO-LN-863
Contract OEO-B99-4873
See also Volume 1, PB-197 758.

Descriptors: *Purchasing, Coordinated procurement, *Consumers, Economic factors, Cooperation, Financing, Project planning, Economic development, Marketing, Credit, Evaluation.

Identifiers: Cooperatives, Credit unions, Low income consumers, *Consumer's cooperatives, Marketing cooperatives, Service cooperatives, Cooperative enterprises, Buying clubs.

Evaluations are given of the following individual projects: Consumer action program for Bedford-Stuyvesant, Inc. (CABS); Lower east side economic development association for cooperatives (LE-SEDA); New York institute for consumer education and development (NYI); Tulsa economic opportunity task force; Metropolitan cooperative services, inc.; Newark personal loan program (NPLP); Bay area neighborhood development foundation; Rural action for better consumer development; Watts labor community action committee; Pilsen neighbors community council; Action for Boston community development; Martin Luther King/Arthur Capper Store; Kleberg county consumers', inc.; Grocery bag store; Detroit consumers' federal credit union.

SELECTED APPROPRIATE TECHNOLOGIES

- PB-198 035** **PC A05 MF A01**
 California Univ., Berkeley. Inst. of Transportation and Traffic Engineering.
Opportunities for Cost Reduction in the Design of Transport Facilities for Developing Regions. Annex to Volumes 1 and 2
 Special rept.
 Dec 70, 98p
 Contract DOT-OS-A9-004
 See also Volume 1, PB-195 597, and Volume 2, PB-195 598.
- Descriptors:** *Roads, Cost engineering, *Construction, Roads, *Transportation, *Developing countries, Design standards, Mathematical models, Maintenance, Operating costs, Pavements, Vehicular traffic, Cost control.
Identifiers: Low cost road construction, Technical assistance, Tradeoffs.
- The annex is a supplement to a study that examines designs of transport facilities in the developing countries with a view toward reducing initial and/or operating costs, or to reducing costs devoted to imported elements. For the annex, research is focused on economic and engineering aspects of low-cost road construction. A production-function based model is developed for road maintenance cost estimation. Surface maintenance is considered in detail. Principal variables included are time, climate, and traffic volume. Another section of the annex contains a discussion of tradeoffs between construction costs and maintenance costs. (Author)
- PB-198 125** **PC A06 MF A01**
 Robert S. Kerr Water Research Center, Ada, Okla. Treatment and Control Research Program.
Water Quality Management Problems In Arid Regions
 Water pollution control research series
 James P. Law, Jr. and Jack L. Witherow. Oct 70, 109p* FWQA-13030-DYY-06/69
- Descriptors:** *Arid land, *Water pollution, *Nitrates, Water pollution, *Sewage treatment, *Water reclamation, *Agricultural wastes, Water pollution, *Irrigation, Water pollution, Denitrification, Algae, Salinity, Desalting, Water quality, Industrial wastes, Ground water, Chemical removal(Water treatment).
- An international conference entitled 'Arid Lands in a Changing World' sponsored by the American Association for the Advancement of Science Committee on Arid Lands and the University of Arizona, was held at Tucson in June, 1969. The report presents a selected group of the papers presented at those sessions which should benefit those concerned with water quality management problems in arid regions. The title of the papers included in this report are as follows: Nitrate removal from agricultural wastewater; the effects of salinity standards on irrigated agriculture in the Colorado River basin; Problems of pollution of irrigation waters in arid regions; Water quality requirements and reuse of wastewater effluents; Salinity control in return flow from irrigated areas—a demonstration project; Water quality control problems in inland sinks; Natural pollution in arid land waters; Distillation of wastewaters: A water resource for arid regions; and Animal waste runoff—a major water quality challenge. (WRSIC abstract)
- PB-199 493** **PC A20 MF A01**
 Urban Systems Research and Engineering, Inc., Cambridge, Mass.
Metropolitan Water Management: Case Studies and National Policy Implications
 Final rept.
 Jun 71, 457p* NWC-EES-71-002
 Contract NWC-70-030
- Descriptors:** *Water resources, *Urban planning, *Government policies, Water resources, Management planning, Water supplies, Water services, Water quality, Water law, Recreational facilities, Sewage treatment, Economic development, Economic forecasting, Objectives, Waste disposal, Grants, Decision making, Professional personnel, Texas, Wisconsin, Massachusetts, Washington(State).
- Identifiers:** *Boston(Massachusetts), *Lubbock(Texas), *Milwaukee(Wisconsin), *Seattle(Washington).
- Planning, decision making, and implementation practices in urban-water management were studied in 12 metropolises. Four were examined in detail on-site: Boston(Massachusetts), Lubbock(Texas), Milwaukee(Wisconsin), and Seattle(Washington). Water supply, sewage collection and treatment, water-quality control, and water-based economic and recreational activity were examined for range of objectives, technical and institutional approaches, exogenous influences, future problems and trends, and the effect of Federal policies. Specific recommendations for Federal action to improve financing, personnel practices, operations, availability of data and analyses, and the institutional and legal framework of water planning, decision making, and implementation are made. (NWC abstract)
- PB-200 967** **PC A03 MF A01**
 Oregon Univ., Eugene. Bureau of Governmental Research and Service.
Self-Help Housing In Oregon
 Innovative study series no. 5.
 1970, 50p
 See also Rept. no. 4, PB-200 964.
- Descriptors:** *Residential buildings, Projects, *Regional planning, *Oregon, Construction, Methodology, Rural areas, Cost analysis, Feasibility, Economic surveys, Statistical data, Sociometrics, Public administration, Demography.
Identifiers: *Self help housing, *Low income housing.
- Self-help housing, the use of one's own nonprofessional labor in construction of a dwelling, used to be a popular way to build a house, but with the advent of labor specialization, complicated construction materials and techniques, financing mechanisms, building codes, and limited access to free materials, it has become less important in the United States. The report describes the housing program in the Willamette Valley in Oregon.
- PB-201 729** **PC A04 MF A01**
 Mississippi State Univ., State College. Water Resources Research Inst.
Community Organization and Rural Water System Development
 John H. Peterson, Jr. 1971, 60p OWRR-B-005-MISS(1)
- Descriptors:** *Water supply, Rural areas, *Communities, Water supply, Community development, Urban planning.
Identifiers: Rural water system development, Community organization.
- Rural communities in a representative county were studied to determine the range of community experiences in water system development and to establish the relationship between community organization and water system development. (WRSIC abstract)
- PB-202 778-Set** **PC-GPO**
 Mitre Corp., McLean, Va.
A Technology Assessment Methodology
 Jun 71, 1570p* in 7 vols Rept no. MTR-6009
 Contract OST-26
- Consists of Volumes 1-6 and Project Summary. Individual volumes are available in paper copy only at various prices. See PB-202 778-1 thru PB-202 778-7.
- Descriptors:** *Research, Assessments, Forecasting, Social change, Cost effectiveness, Benefit cost analysis, Decision making, Social sciences, Sewage treatment, Aquaculture, Enzymes, Air pollution, Computers, Methodology.
Identifiers: *Technology assessment.
- The research described is concerned with the development of an analytical framework and a structured procedure that can be used for anticipating the social impacts of major technologies. Five examples are presented dealing with the following: Automotive emissions; Computers--communications
- tions; Enzymes (Industrial); Mariculture (Sea farming); and Water pollution from domestic wastes.
- PB-202 778-1** **PC A14**
 Mitre Corp., McLean, Va.
A Technology Assessment Methodology. Volume I. Some Basic Propositions
 Final rept.
 Martin V. Jones. Jun 71, 307p* Rept no. MIR-6009-1
 Contract OST-26
 Also included in PB-202 778-Set, PC\$31.50, MF\$9.00. See also PB-202 778-2.
- Descriptors:** *Research, Assessments, *Research management, Assessments, Forecasting, Social change, Cost effectiveness, Benefit cost analysis, Decision making, Social sciences, Project management, Methodology.
Identifiers: *Technology assessment.
- This is one of six reports on the subject of technology assessment prepared by MITRE for the Office of Science and Technology, Executive Office of the President. The purpose of this project was to develop a standard, structured method for making studies directed toward anticipating and influencing the societal impacts of new technology applications. This volume describes the standard methodology that was developed. The other volumes are 'pilot' assessment studies covering particular fields of technologies that were conducted to help test, develop, and illustrate the standard assessment methodology. (Author)
- PB-202 778-2** **PC A10**
 Mitre Corp., McLean, Va.
A Technology Assessment Methodology. Volume II. Automotive Emissions
 Final rept.
 Willis E. Jacobsen. Jun 71, 205p* Rept no. MTR-6009-2
 Contract OST-26
 Also included in PB-202 778-Set, PC\$31.50, MF\$9.00. See also PB-202 778-1 and PB-202 778-3.
- Descriptors:** *Air pollution, Assessments, *Exhaust gases, *Automobile engines, Forecasting, Social change, Benefit cost analysis, Cost effectiveness, Decision making, Methodology, Public health, Internal combustion engines, External combustion engines, Environmental surveys, Government policies, Economic analysis, Highway transportation, Abatement, Mass transportation, Monitors.
Identifiers: *Technology assessment, *Automobile exhaust, Hybrid vehicular propulsion.
- The pilot study on automotive emission control is one in a series of five, each addressing different technologies. A framework for appraising societal influences of control strategies (technological and nontechnological) for reducing noxious automotive emissions is developed and illustrative examples, based on a proposed cost/benefit model, are presented. (Author)
- PB-202 778-3** **PC A12**
 Mitre Corp., McLean, Va.
A Technology Assessment Methodology. Volume III. Computers-Communications Networks
 Final rept.
 Hugh V. O'Neill. Jun 71, 261p* Rept no. MTR-6009-3
 Also included in PB-202 778-Set PC\$31.50, MF\$9.00. See also PB-202 778-1 and PB-202 778-4.
- Descriptors:** *Computers, Assessments, *Computer systems hardware, Man machine systems, Telecommunication, Information systems, Data processing, Time sharing, Real time operations, Data, Forecasting, Social change, Cost effectiveness, Benefit cost analysis, Decision making, Social sciences, Methodology.
Identifiers: *Technology assessment, *Computer privacy.
- The paper describes a pilot computer technology assessment study. The study has as its goal the

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development and illustration of technological assessment methodology and in addition, as a secondary objective, the investigation of certain salient segments of the general computer situation. The report includes: a summary; task definition; technology descriptions; state of society/universe assumptions, attributes, and conditions; relevant impact areas; initial impact analysis; action options and recommendation for future research and development program; forecasts/projections, uncertainty and analysis of future impacts; and, conclusions and recommendations. (Author)

PB-202 778-4 PC A11
 Mitre Corp., McLean, Va.
A Technology Assessment Methodology.
Volume IV. Enzymes (Industrial)
 Final rept.
 David H. Rubin. Jun 71, 226p* Rept no. MTR-6009-4
 Contract OST-26
 Also included in PB-202 778-Set PC\$31.50, MF\$9.00. See also PB-202 778-3 and PB-202 778-5.

Descriptors: *Enzymes, Assessments, *Industrial engineering, Enzymes, *Chemical engineering, Enzymes, *Food industry, Enzymes, Forecasting, Social change, Benefit cost analysis, Cost effectiveness, Decision making, Methodology, Environmental surveys, Economic analysis, Pollution, Medicine, Public health, Detergents, Law(Jurisprudence), Models, Methodology.
 Identifiers: *Technology assessment.

A general technology assessment methodology is used to assess the impacts of developments in enzyme science and technology with particular emphasis on industrial applications. Forecasts are presented of likely technological developments and application areas are described in which the impacts have significant societal interactions. Case studies include detergents, biodegradable containers, conversion of dextrose to starch, possible substitute for cane sugar, cellulases, and enzymes used against oil spills. Forecasts are made of the societal impact areas which will be most affected by enzyme technology. First-order impacts and higher order interactions are presented. Action options are described which could influence the developments of enzyme technology in desirable directions. (Author)

PB-202 778-5 PC A10
 Mitre Corp., McLean, Va.
A Technology Assessment Methodology.
Volume V. Mariculture (Sea Farming)
 Final rept.
 Robert C. Landis. Jun 71, 205p* Rept no. MTR-6009-5
 Contract OST-26
 Also included in PB-202 778-Set PC\$31.50, MF\$9.00. See also PB-202 778-4 and PB-202 778-6.

Descriptors: *Aquaculture, Assessments, *Developing countries, Aquaculture, Benefit cost analysis, Forecasting, Environmental surveys, Economic analysis, Decision making, Methodology, Human nutrition, Cost effectiveness, International trade, Proteins, Water pollution, Infant nutrition, Social change, Models, Government policies, Fisheries. Identifiers: *Technology assessment.

A general technology assessment methodology is used to determine the impacts of mariculture on the developing countries. The technology is confined to application in coastal and brackish waters. A quantitative impact analysis of economic and social factors is shown for the years 1975-1989. Various action options are offered and a revised impact forecast is given for increased impact on the malnutrition problem. The problems and constraints to accelerated mariculture application are analyzed, and a forecast of 20 million tons of mariculture production in 1985 is made. Also, a subjective probability of which countries will apply mariculture is given. (Author)

PB-202 778-6 PC A15
 Mitre Corp., McLean, Va.

A Technology Assessment Methodology.
Volume VI. Water Pollution: Domestic Wastes
 Final rept.
 Victor D. Wenk. Jun 71, 331p* Rept no. MTR-6009-6
 Contract OST-26
 Also included in PB-202 778-Set PC\$31.50 and MF\$9.00. See also PB-101 778-5 and PB-202 778-7.

Descriptors: *Sewage treatment, Assessments, *Water pollution, *Sewage, Benefit cost analysis, Septic tanks, History, Forecasting, Social change, Environmental surveys, Decision making, Methodology, Economic analysis, Government policies, Cost estimates, Soil chemistry, Abatement, Nutrients, Cost effectiveness, Chemical removal(Sewage treatment), Models, Land use, Ground water.
 Identifiers: *Technology assessment.

A general technology assessment methodology is used to determine the impacts of widespread use of individual home sewage treatment technology during the 1970-1989 time period. The effects of varying rates of diffusion of this technology are analyzed in terms of selected measures of economic and environmental impact. Social and institutional impacts are discussed. Various action options available to identified interest groups are analyzed in terms of their effect upon technology diffusion rates and specific impact areas. The normative nature of this technology assessment called for the use of a dynamic interactive model of the technology diffusion process. (Author)

PB-202 778-7 PC A03
 Mitre Corp., McLean, Va.
A Technology Assessment Methodology. Project Summary
 Final rept.
 Martin V. Jones. Jun 71, 35p* Rept no. MTR-6009-7
 Contract OST-26
 Also included in PB-202 778-Set PC\$31.50 and MF\$9.00. See also PB-202 778-6.

Descriptors: *Research, Assessments, Forecasting, Social change, Cost effectiveness, Benefit cost analysis, Decision making, Social sciences, Sewage treatment, Aquaculture, Enzymes, Air pollution, Methodology.
 Identifiers: *Technology assessment.

The paper summarizes the findings of an exploratory technology assessment project jointly sponsored by the Office of Science and Technology, Executive Office of the President, and The MITRE Corporation. The objective of the project was to develop an analytical framework and a structured procedure that could be used for anticipating the societal impacts of major technologies. Detailed findings are reported in six volumes. (Author)

PB-203 331 PC A04 MF A01
 National Academy of Sciences, Washington, D.C.
The International Development Institute
 Jul 71, 67p TA/OST-NAS-71-32
 Contract AID-csd-2584
 A report of an Ad Hoc Committee of the Board on Science and Technology for International Development.

Descriptors: *International relations, Organizations, *Foreign aid, Economic development, Research management, Manpower.

This is a report prepared by a committee convened by the National Academy of Sciences in October 1970 at the request of the Agency for International Development, to consider the character, purposes, and functions of a United States International Development Institute. Listed are the members of the ad hoc Committee on the International Development Institute and members of the Board on Science and Technology for International Development, Office of the Foreign Secretary, National Academy of Sciences. The report endorses the concept of such an Institute, and outlines proposals for its organizational structure and program objectives.

PB-203 379 PC A03 MF A01
 National Academy of Sciences, Washington, D.C.
International Aspects of Man's Effect Upon Environment
 Summary rept.
 Roger Revelle. Jan 70, 29p TA/OST-NAS-70-27
 Contract AID/csd-1122

Descriptors: *Foreign aid, *Environmental surveys, *Pollution, Foreign aid, *Developing countries, Environmental surveys, International assistance, Legislation, Pesticides, Dams, Reservoirs, Water quality, Ecology, Government policies.

The summary on Environmental Aspects of Foreign Assistance Programs by the Agency for International Development (AID) presents conclusions on the following topics: Which aspects of AID international assistance have the possibility of creating problems of environmental degradation; Which of the problem areas should receive priority attention; How may AID strengthen the capabilities of the United States and the developing countries in dealing with environmental problems. A list of fourteen major areas in which man is having seriously deleterious effects upon his environment is attached.

PB-203 491 PC A02 MF A01
 New Mexico State Univ., Clovis. Plains Branch Agricultural Experiment Station.
Utilization of Water in a Semi-Arid Region
 Completion rept.
 H. Dale Fuehring. Jun 71, 5p OWRR-A-027-NMEX(1)

Descriptors: *Water supply, Utilization, *Arid land, Moisture, Watersheds, Rainfall, Volume, Herbicides, Agriculture, Drought.
 Identifiers: Atrazine, Propazines.

In order to assess the value for dryland cropping in a semi-arid region of concentrating rainfall by means of micro-watersheds, a study was established with width of micro-watershed, width of growing bed, plant population, and applied level of nitrogen fertilizer as variables. Due to very low rainfall, little water was available for concentration and yields of winter wheat and winter barley were very low and were decreased with increasing amount of watershed area (proportionately less of area planted). A study on use of herbicides indicates propazine and atrazine applied on the watershed areas may control weeds without injury to crops. It was concluded that the first year results of the study were atypical because of extreme drought and that several years data will be necessary in order to sample various amounts and patterns of annual rainfall and to determine the cumulative effects. (Author)

PB-203 608-D PC A02
 Agricultural Research Service, Washington, D.C.
Boll Weevil Control Program (Cooperative Diapause Control Program), Texas and Mexico
 Draft environmental impact statement.
 22 Oct 71, 18p

Descriptors: *Environmental surveys, Pest control, *Texas, Environmental surveys, *Mexico, Environmental surveys, *Insect control, Environmental surveys, Cotton plants, Animal migrations, Insecticides, Toxicology, Birds, Bees, Rodents, Vegetation.

Identifiers: *Environmental impact statements, *International cooperation, Malathion, *Boll weevils, Aldicarb.

The project is concerned with a pesticide program on the Texas-Mexico border, for the primary purpose of boll weevil control. Adverse impact effects anticipated include the effects of damage to non-target insects and other organisms.

PB-203 844 PC-GPO/MF A01-NTIS
 Hawaii Univ., Honolulu.
Saltinity Tolerances of Certain Tropical Soils and Relationships Between Sodium Ion Activities and Soil Physical Properties
 Research and development progress rept.
 S. A. El-Swaify, L. D. Swindale, and G. Uehara. Mar 69, 55p OSW-PR-419

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Contract DI-14-01-0001-673

Paper copy available from GPO \$0.55 as I1.88:419.

Descriptors: *Soil properties, *Tropical regions, *Irrigation, Soils, *Soils, Salinity, Deterioration, Demineralizing, Salt water, Sodium inorganic compounds, Calcium inorganic compounds, Magnesium inorganic compounds, Soil water, Physical properties, Ions, Acidity, Colloiding, Percolation, Hawaii.
Identifiers: Tropical soils.

Two tropical soils from Hawaii were tested for salinity tolerances, the ability of the soils to resist physical deterioration by saline waters. Hydraulic conductivity measurements showed that presently permissible limits of salinity and sodium in irrigation water can be safely raised because significant hazardous physical conditions are not likely to occur. Both soils possess high resistance to detrimental peptization even when exposed to extreme sodic conditions. The original acidities of soils are highly resistant to change under leaching. Neither soil had a tendency to accumulate soluble salts by extraction from percolating saline waters. The direct determination of ionic activities for sodium, calcium and magnesium ions as a new and more fundamental tool in soil salinity work is discussed. (Author)

PB-204 408 PC A03/MF A01
Agency for International Development, Washington, D.C. Office of Science and Technology.
Water Quality Standards and International Development
Oct 71, 34p Rept no. TA/OST-71-4

Descriptors: *Water quality, Standards, *United States, Water quality, *Developing countries, Water quality, Potable water, Surface waters, Water supply, Chemical analysis, Bacteria, Radioactive contaminants, Water pollution, Control, Planning.

The report summarizes progress to date in establishing water quality standards in the United States and in developing countries. Its purpose is to assist those concerned broadly with environmental policies in developing countries to better understand past efforts and future needs in this field. (Author)

PB-204 492 PC A05/MF A01
Nevada Univ., Reno. Center for Water Resources Research.
Analysis of Ground and Surface Water Utilization in Urbanized Arid Areas
Hydrology and water resources technical rept. G. F. Cochran, J. C. Ohrenschall, and W. C. Wilson. Jan 70, 93p OWRR-C-1337(1970)(1)
Contract H-W-Pub-8

Descriptors: *Ground water, Utilization, *Urban areas, Arid land, *Arid land, Water supply, Water resources, Economic development, Legislation, Population growth, Models, Optimization, Nevada. Identifiers: Las Vegas Valley, Water utilization.

Urbanization in arid regions has been accelerating at a tremendous rate. This type of growth has taken place in the Las Vegas Valley in Southern Nevada and will likely continue elsewhere as the country's population expands. This report's purpose is to examine some of the many facets of water resources developments which have occurred to support the growth in the Las Vegas Valley, with the ultimate objective of optimizing the entire water resource system. The history and economy of the area are dealt with in detail. Estimates of current and future value of water are made, with projections of future population growth and water requirements. Laws and institutions developed to control and manage the area water resources are examined. Potential legal problems are presented and discussed. Physical characteristics of the area's water resources and water production systems are described. Mathematical models are developed which relate water costs to system usage and response. (Author)

PB-205 409 PC A02/MF A01
Commonwealth Scientific and Industrial Research Organization, Canberra (Australia). Div. of Land Research.

Instrumentation for Crop-Environment Measurement in a Tropical Savannah Climate
G. F. Byrne, C. W. Rose, J. E. Begg, W. R. Torsell, and H. G. McPherson. 1971, 19p Rept no. Technical paper-32

Descriptors: *Meteorological instruments, Data processing, *Micrometeorology, Tropical regions, Plants(Botany), Water vapor, Carbon dioxide, Forage grasses, Heat flux, Climatology, Mass transfer, Energy, Lysimeters, Data processing equipment, Errors, Australia.

Instrumentation used in the study of the energy, water vapour, and carbon dioxide fluxes involved in the growth of two tropical forage crops is described, the system being based on a digital data logging system and a weighing lysimeter. The data handling procedure is outlined and the sampling and measurement errors likely to occur are considered. (Author)

PB-205 761 PC A07/MF A01
Trust Territory of the Pacific Islands, Saipan, Mariana Islands. Economic Development Div.
Copra Processing in the Trust Territory. A Report to the Congress of Micronesia
William H. Stewart. 1971, 138p

Descriptors: *Mariana Islands, *Copra processing, Economic development, Vegetable oils, Industrial plants, Market research, International trade, Revenue, Food consumption.
Identifiers: Coconut meal.

The report analyzes the factors involved in processing copra in the Trust Territory into crude coconut oil and copra cake. The report is more than a feasibility analysis in that it discusses the economics of manufacturing or processing in the Trust Territory. (Author)

PB-206 121 PC A03/MF A01
Arizona Univ., Tucson.
Modeling of Hydrologic Processes and Water Salvage Procedures in Semiarid Regions
Rept. for Jul 69-Jun 71
M. M. Fogel, J. L. Thamis, and L. Duckstein. 25 Dec 71, 41p OWRR-A-020-ARIZ(4)
Contract DI-14-01-0001-1622

Descriptors: *Surface water runoff, Mathematical models, *Rainfall, Semiarid land, *Water resources, Management planning, Probability theory, Random variables, Rainfall intensity, Thunderstorms, Monte Carlo method.

A methodology is set forth to model and analyze rainfall and runoff events utilizing the basic concepts of probability theory to the general modeling problem. The procedure looks at an event such as thunderstorm rainfall in light of the number of occurrences in a given time period and the magnitude and spatial distribution of each event. A Poisson distribution was found to adequately describe the number of events per season and a geometric distribution for the depth of rainfall at a point per storm. These distributions were then combined to produce an extreme-value distribution for thunderstorm rainfall. (Author)

PB-206 539 PC A20/MF A01
Central Treaty Organization, Ankara, (Turkey).
CENTO Symposium on Hydrology and Water Resources Development. Held in Ankara, Turkey, 7-12 February 1966
Dec 66, 464p TA/OST-AN-66-2-1

Descriptors: *Hydrology, *Water resources, Economic development, Economic factors, Ground water, Surface waters, Developing countries, Meetings, Turkey.
Identifiers: *Water resources development, CENTO.

The document presents the papers delivered at a symposium on hydrology and water resources development held in Ankara, Turkey, 2-12 February

1966. It is felt that the meeting marked a step forward in considering the extent and need to develop knowledge of a region's water resources as a vital foundation for economic development programs. The general topics covered include water resources development, surface hydrology, groundwater hydrology, and agricultural and industrial problems. (Author)

PB-206 549 PC A14/MF A01
Kaiser Engineers, Oakland, Calif.
A Manual on Water Desalination. Volume I. Technology
Apr 67, 322p TA/OST-AN-67-4-1
Contract AID/csd-1440
See also Volume 2, PB-206 550.

Descriptors: *Desalting, *Reviews, Manuals, Distillation, Freezing, Electrodialysis, Osmosis, Evaporation, Electric power plants, Nuclear power plants, Materials recovery, Brines, Industrial plants, Industrial engineering, Chemical engineering, Water supply, Feasibility, Design criteria, Developing countries.

Identifiers: Electrodialysis desalination, Reverse osmosis desalination, Vertical tube evaporation, Multistage flash distillation, Vapor compression distillation, Solar distillation, Vacuum freeze vapor compression desalination.

The manual has been prepared as a guide in evaluating the feasibility of desalination in water-short areas where desalination may be competitive with other water sources. The manual is divided into two volumes, which may be used independently of each other. Volume I includes a discussion of the state of the art of the major desalination processes. Specific topics include: Saline water phenomena and definitions; state of the art of distillation, freezing and crystallization, electrodialysis, and reverse osmosis processes; description of typical plants; dual-purpose electric power generation-water desalination plants; recovery of chemicals as by-products; summary of major conceptual design studies.

PB-206 550 PC A09/MF A01
Kaiser Engineers, Oakland, Calif.
A Manual on Water Desalination. Volume II. Economics
Apr 67, 179p TA/OST-AN-67-4-2
Contract AID/csd-1440
See also Volume 1, PB-206 549.

Descriptors: *Water supply, *Desalting, *Developing countries, Desalting, Water resources, Economic development, Feasibility, Questionnaires, Cost estimates, Sea water, Brackish water, Solubility, Capital costs, Operating costs, Site surveys.

The report provides guidelines for the initiation of a program for defining and solving the water shortage problems of a particular nation or region using desalination. Its scope includes the formulation of a logical and feasible water development plan; the accomplishment of preliminary feasibility studies on the possible solutions, and the determination of the most promising course of action based upon the results of these studies; and the accomplishment of a detailed engineering feasibility and economic study of the possible alternatives. A series of estimating aids and nomographs for determining capital costs of desalination plant facilities is included. (Author)

PB-206 698 PC A03/MF A01
General Electric Co., Schenectady, N.Y. General Engineering Lab.
Refrigeration-Cooling Systems for Rural Communities in Developing Countries
Dec 62, 45p TA/OST-AN-62-12-1
Contract AID-REPAS-1

Descriptors: *Developing countries, Food storage, *Food storage, *Refrigerating, Evaluation, Ice refrigeration, Controlled atmospheres, Steam jet refrigeration, Thermoelectric refrigeration, Transport refrigeration, Rural areas.

A review and evaluation is provided of alternative refrigeration-cooling systems for application in the rural areas of newly developing countries. The

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available equipment suited to the needs of these countries is identified, and development opportunities for improved equipment systems are delineated. The scope of the document is restricted to community or village sized facilities for fresh food preservation. A list of equipment manufacturers is included. (Author)

PB-206 700 **PC A08/MF A01**
 Central Treaty Organization, Ankara (Turkey).
CENTO Conference on Industrial Vocational Education Held In Ramsar, Iran on June 23-30, 1968
 Apr 69, 171p TA/OST-AN-69-4-1

Descriptors: *Industrial training, *Developing countries, Planning, Instructors, Counseling, Meetings, Turkey.
 Identifiers: *Vocational education.

The report provides the texts of most of the papers presented at a conference on the problems of vocational industrial education. Some of the topics covered are: manpower planning and vocational education; elements of a coordinated national program; education and training patterns for developing manpower; developing effective programs for vocational education and training; structure and use of advisory committees on vocational education; programs for preparing teachers; occupational testing, guidance, counselling, and follow-up.

PB-206 701 **PC A22/MF A01**
 Central Treaty Organization, Ankara (Turkey).
Seminar on Evaluation of Water Resources With Scarce Data, Held In Tehran, Iran on March 4-8, 1969
 Final rept.
 Jan 70, 515p TA/OST-AN-70-1-2

Descriptors: *Water resources, Evaluation, *Hydrology, Developing countries, Meetings, Stream flow, Watersheds, Droughts, Water quality, Surface water runoff, Agriculture, Water supply, Water storage, Reservoirs, Iran.

The report is comprised of papers, originally presented at a seminar held 4-8 March 1969 in Tehran, Iran, which deal with the evaluation of water resources within the limitations imposed by this scarcity of data. Some of the topics covered are: Minimal data gathering procedures; Maximum utilization of scarce data in hydrological design; Preparation of long term flow sequence from short term records; Drought frequency analysis by means of synthetic flow sequences; Estimation of factors controlling streamflow in areas of limited data; Land treatment in agricultural watershed hydrology research. (Author)

PB-206 775 **PC A12/MF A01**
 Continental-Allied Co., Inc., Washington, D.C.
Five Industries for the Central African Republic
 Erwin J. Sholtow, and Edward A. Tenenbaum.
 Nov 65, 267p TA/OST-AN-65-11-1
 Contract AID/afr-288

Descriptors: *Developing countries, Industries, *Economic development, Developing countries, Surveys, Profits, Investments, Demand(Economics), Capital, Marketing.
 Identifiers: *Central Africa Republic.

Isolated by geography, lacking low-cost means of transportation, the Central Africa Republic earns comparatively little from her exports, and pays heavily for her imports. It is considered imperative that the C.A.R. reorient her economy towards manufacture of goods for her own market. A survey was made of private investment opportunities in industry and commerce in the C.A.R. Five possible new industries - storage batteries, asbestos cement, starch, reconstituted milk and ice cream, and tomato puree - were selected on the basis of this survey and studied in detail. In each case, it was found that the industry can operate to serve C.A.R.'s internal market, to reduce present prices, and to earn a profit of at least 25% per annum. (Author)

PB-206 776 **PC A08/MF A01**
 Central Treaty Organization, Ankara(Turkey).
CENTO Traveling Seminar on Farm Tools and Implements
 Sep 68, 154p TA/OST-AN-68-9-1

Descriptors: *Agricultural machinery, Surveys, *Developing countries, Agricultural machinery, Handbooks, Pakistan, Iran, Turkey.

A survey was carried out in Pakistan, Iran, and Turkey to help determine what could be done to provide farmers of these countries with better farm tools and more power to help them increase farm production. Major emphasis was laid on the collection of information on tools and implements in current use. In addition, consideration was given to a number of tools and attachments which it was felt should be of wider use than at present. This report was prepared as a result of the survey. It is in the form of a handbook for use by agricultural technicians, extension workers, farmers, students, and producers of farm machinery as an aid in their work to promote practical, useable ideas which apply to their areas. (Author)

PB-206 790 **PC A17/MF A01**
 Iowa State Univ., Ames. Center for Agricultural and Rural Development.
Agricultural Water Demands. Future Water and Land Use: Effects of Selected Public Agricultural and Irrigation Policies on Water Demand and Land Use
 Final rept.
 Earl O. Heady, Howard C. Madsen, Kenneth J. Nicol, and Stanley H. Hargrove. Nov 71, 388p NWC-F-72-031
 Contract NWC-71-013

Descriptors: *Water supply, *Agriculture, *Land use, Water resources, *Irrigated land, Forecasting, Arable land, Mathematical models, Population growth, Policies, Prices, Farm crops, Poultry, Food, Fibers, Livestock, Water quality, Demand(Economics), Linear programming, International trade, Statistical data.

The primary objective of the study is to determine whether the Nation has enough water and land to satisfy its future food and fiber needs. Secondary objectives are to estimate agricultural demands for water, to illustrate the substitutions between water and land and to estimate levels of commodity prices, value of water rights and land rents related to water use alternatives. The study is based on a large-scale linear programming model of U.S. agriculture. The analysis incorporates alternative sets of parameters for (1) population, (2) water prices, (3) technological advance, (4) exports and (5) absence or existence of government supply control programs. All projections are for the year 2000. (Author)

PB-206 798 **PC A10/MF A01**
 General Electric Co., Schenectady, N.Y. General Engineering Lab.
Preliminary Report of Field Survey Teams on the Generation and Utilization of Power in Rural Areas of Developing Countries
 Sep 62, 211p TA/OST-AN-62-9-1
 Contract AID-REPAS-1
 See also PB-206 800 and PB-206 801.

Descriptors: *Electrification, *Rural areas, *Developing countries, Electrification, *Electric power generation, Developing countries, Electric generators, Electric power plants, Utilization, Economic analysis.

The report presents the principal impressions and tentative conclusions of field investigations on the generation and utilization of electric power in rural areas which were conducted in India, Chile, Colombia, and Peru. The first part of the report provides a general review of existing rural electrification programs in India and Colombia. The remaining portions contain the observations of the field survey teams on the significance of small scale power units from the standpoint of village development programs.

PB-206 799 **PC A06/MF A01**
 Michigan Univ., Ann Arbor. Architectural Research Lab.
A Preliminary Investigation of the Potential use of Foam Plastics for Housing in Underdeveloped Areas
 Rept. dated Jul 62-Feb 63
 Stephen C. A. Paraskevopoulos, Harold J. Borkin, Robert M. Darvas, and C. Theodore Larson. Feb 63, 102p TA/OST AN-63-2-1

Descriptors: *Houses, *Cellular plastics, *Developing countries, Houses, Structural plastics, Structural engineering, Structural design, Mechanical properties, Production methods, Construction, Laminated plastics.

The report describes a study of the feasibility of using plastics, particularly foam plastics, for low-cost housing in developing countries. The advantages of foam plastics are reviewed, as are the important physical properties, present structural applications, and potential uses in housing of the materials. The mechanical properties of foam plastics are discussed from the point of view of structural engineering, production methods, and erection techniques. A number of promising structures are illustrated. (Author)

PB-206 800 **PC A06/MF A01**
 General Electric Co., Schenectady, N.Y. Advanced Technology Labs.
Small-Scale Power Supplies for Rural Communities in Developing Countries
 Mar 63, 120p TA/OST-AN-63-3-1
 Contract AID-REPAS-1
 See also PB-206 798 and PB-206 801.

Descriptors: *Electric power generation, *Rural areas, *Developing countries, Electric power generation, Electric power plants, Electric generators, Economic analysis, Utilization.

The report describes and evaluates alternative small-scale technologies for supplying electric energy to rural communities in developing countries. It appraises the technical suitability of currently available small-scale power supplies, and delineates near-term and far-term development opportunities for improved equipment systems. The technologies considered include: Internal combustion engine generators; small scale hydroelectric plants; thermal vapor engine generators; gas turbine generators; wind generators, photovoltaic solar cells; thermoelectric generators; and fuel cells.

PB-206 801 **PC A03/MF A01**
 General Electric Co. Schenectady, N.Y. Advanced Technology Labs.
Generation and Utilization of Power for Rural Communities in Developing Countries
 Summary rept.
 May 63, 39p TA/OST-AN-63-5-1
 Contract AID-REPAS-1
 See also PB-206 798 and PB-206 800.

Descriptors: *Electrification, *Rural areas, *Developing countries, Electrification, *Electric power generation, Developing countries, Electric generators, Electric power plants, Utilization, Economic analysis.

The principal objective of the project was to assess the need for and significance of electric power for the development of rural communities, with particular attention to the utility and feasibility of small scale power supplies as a means of providing power to village communities. The specific areas of concern included: Small-and intermediate-scale generating plants and grid connections for rural communities; utilization of electric power in rural communities for irrigation, rural industry, and illumination; technical appraisal of potential small-scale power sources, refrigeration-cooling systems, and water treatment processes; and technical support for rural development. (Author)

PB-206 803 **PC A10/MF A01**
 Robinson (C. W.) and Co., Inc., New York.
Cooperative Effort in Industrial Development
 Final rept. 1962-1966.

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Dec 66, 203p TA/OST-AN-66-12-1
Contract AID/nesa-28

Descriptors: *Nepal, *Industries, *Economic development, *Developing countries, Reviews, Project planning, Investments, Banking business, Financial management.

The Nepal Industrial Development Corporation (NIDC) has the responsibility of coordinating the Nepalese Government's program to mobilize private capital in sound and profitable industrial enterprises. This report summarizes selected activities and achievements that have been of particular significance in the success of the NIDC during the period from July 1962 to December 1966. Among the topics discussed are: Management of NIDC; banking activities; meeting special problems of bank clients; investment promotion; development of human resources; pre-investment studies; industrial districts. (Author)

PB-206 804 PC A13/MF A01
Central Treaty Organization, Ankara, (Turkey).
CENTO Conference on Agricultural Extension, Held In Ankara-Denizli-Izmir, Turkey, 12-22 April 1967
Oct 67, 286p TA/OST-AN-67-10-1

Descriptors: *Education, Developing countries, *Agriculture, Economic development, Meetings, Agricultural machinery, Marketing, Livestock, Fertilizers, Iran, Pakistan, Turkey.

Identifiers: *Agricultural extension work.

Agricultural extension is an educational process. It brings to agricultural communities the knowledge and skills developed by research institutions, and by making these known it seeks to improve the level of agricultural production. This report is comprised of papers presented at a symposium, held in Ankara, Denizli, and Izmir, Turkey, 12-22 April 1967, which was called to provide an opportunity for extension service officials to review practical approaches to successful extension work at the farmer level. (Author)

PB-206 805 PC A13/MF A01
Mississippi State Univ., State College. Seed Technology Lab.
Seed Processing and Handling
Charles E. Vaughan, Bill R. Gregg, and James C. DE Louche. Jan 68, 296p Handbook-1, TA/OST-AN-68-1-1
Contract AID/W-607

Descriptors: *Seeds, *Processing, Handling equipment, Developing countries, Handbooks.
Identifiers: *Seed processing.

Seeds are processed to remove contaminants, to size-grade for plantability, to remove damaged or deteriorated seed, and to apply seed treatment materials. This handbook was prepared as an introduction to seed processing and handling. Various types of equipment are considered. The main features and component parts, principles of separation, uses, and operational procedures are discussed for each machine. Emphasis is placed on the concept of the 'processing line', that is, the combination, proper sequence and arrangement of machines, conveyors, and procedures required for handling and processing seeds. (Author)

PB-206 806 PC A04/MF A01
International Rice Research Inst., Los Banos, Laguna, (Philippines).
Performance and Economics of Use of Small Equipment in Tropical Monsoon Countries: The Case of the Philippines
Stanley S. Johnson. Apr 68, 52p TA/OST-AN-68-4-1

Descriptors: *Agricultural machinery, *Philippines, Economic development, Developing countries, Monsoons, Performance.

Mechanized agriculture is being introduced in the countries of Southeast Asia with varying degrees of success and acceptance. This paper discusses the status of mechanization in one of those countries, the Philippines. It provides the background in

which this mechanization is proceeding, and then discusses the types of equipment that are being introduced. The performance data of these machines under Philippine conditions, and the economics of their use, are also presented. (Author)

PB-206 851 PC A05/MF A01
Organization for Social and Technical Innovation, Inc., Cambridge, Mass.

Industrial Housing. The Opportunity and the Problems In Developing Areas, Ideas and Methods Exchange No. 66

Ian Donald Terner, and John F. C. Turner. Jan 72, 80p*

Sponsored in part by the Department of Housing and Urban Development, Washington, D.C.

Descriptors: *Residential buildings, *Mass production, *Developing countries, Residential buildings, Reviews, Building, Industries, Automation, Construction, Prefabrication, Feasibility, Errors, Standards, Mass production, Manufacturing, Expenses, Asia, Africa, South America.
Identifiers: *Industrialized housing.

The problem of providing suitable shelter in the world's less developed nations is one of critical urgency. While this problem grows more and more acute, the industrialized nations of North America and Europe are struggling to meet their own housing needs through an increasingly advanced technology. It is a natural consequence of this process for housing manufacturers, technicians and public officials to seek possible applications of this advanced technology in less developed countries. In recent years, HUD's Office of International Affairs has increasingly been called upon to advise domestic housing producers and, through AID, foreign governments and developers on the appropriateness of industrialized techniques abroad. It has attempted to correct widely held misconceptions, while witnessing the costly failures of many attempts to develop criteria to assess the value of existing industrialized systems abroad, and at the same time to assist in the design of new systems created specifically for that market. (Author)

PB-206 902 PC A04/MF A01
Agency for International Development, Washington, D.C.

Industrializing at the Grass Roots Level in the Philippines

Rept. for 1959-1963

Kenneth P. Sheldon. 1963, 63p TA/OST-AN-63-13-1

Descriptors: *Developing countries, Industries, *Economic development, Developing countries, *Philippines, Economic development, Surveys, Natural resources, Agriculture.
Identifiers: Tarlac(Philippines).

The establishment of a first industry in an underdeveloped region stimulates others into being; a small beginning is enough to set up a chain reaction. This principle has been demonstrated time and again in the Philippines and in other developing countries. The document shows how this start was made in the highly agricultural provinces in the Philippines and the proper way for it to develop. In addition to a general discussion of principles and procedures, the document contains, for the purpose of providing a concrete example, a detailed report of a survey made of a single Philippine province (Tarlac) to obtain practical information concerning its resources, natural advantages, and the desires of its people regarding industrialization. (Author)

PB-206 904 PC A11/MF A01
Stanford Research Inst., Menlo Park, Calif.

An Industrial Park Development Program for Central America

Keith E. Duke, Phillip L. Adams, and Robert W. Davenport. Nov 64, 234p TA/OST-AN-64-11-2

Descriptors: *Central America, *Industries, *Economic development, *Developing countries, Feasibility, Project planning, Industrial plants, Parks, Roads, Site surveys, Plant location, Financial management.

Identifiers: Industrial parks, Industrial development.

The development of a number of industrial parks in Central America could be an important means of stimulating industrial growth and promoting industrial development in this region. This document provides the results of a study undertaken to determine the desirability and feasibility of establishing such industrial parks, and to define the nature, scope, and costs of an industrial parks program. The topics covered include the purposes and characteristics of industrial parks in Central America, the physical infrastructure and its general influence on industrial growth and location of industrial parks in the region, specific proposed locations for industrial park sites, and financial and organizational resources for an industrial parks program. (Author)

PB-206 913 PC A04/MF A01
Colorado State Univ., Fort Collins.

Project Colorado. Feasibility Studies. Preliminary Designs

Harry F. Troxell, and Carlos E. De Sa. 1964, 61p TA/OST-AN-64-13-1

Prepared in cooperation with Bahia Univ., Salvador (Brazil).

Descriptors: *Economic development, *Developing countries, *Industries, *Brazil, Industrial mobilization, Feasibility, Food industry, Ceramics.

Identifiers: Colorado project, Ceramics industry.

Project Colorado is a program of cooperation for industrial development in the State of Bahia, Brazil. The objectives, to develop new small, rural industries and to train business and engineering leaders, are accomplished by utilizing faculty and students from the University of Bahia and Colorado State University. The industrial development activities are based on a thorough analysis of the advantages and opportunities the region has to offer. Feasibility studies, followed by preliminary designs, were made for the following industries: Poultry and egg; ceramic products; peanut oil extraction; slaughterhouse for cattle and hogs; mandioca processing; and fruit processing. The document contains detailed reports of each of these industrial prospects by the personnel who contributed to the general evaluation, the marketing data, and the production requirements.

PB-206 967 PC A03/MF A01
Small Business Administration, Washington, D.C.
Report on Small Industry Programs in Turkey
Ross D. Davis. 15 Feb 65, 41p TA/OST-AN-65-2-2

Descriptors: *Turkey, *Industries, *Economic development, *Developing countries, Planning, International trade, Evaluation.

Identifiers: Small industry.

The report sets out observations based on a visit to Turkey made in January 1965 by the Executive Administrator of the U. S. Small Business Administration. The purpose of the visit was to evaluate certain plans of the Government of Turkey designed to modernize small-scale industry, to promote its integration into a balanced pattern of industrial development, and to create in small industry a significant capacity for import substitution and export activities. The topics covered in the report include: Role of small industry in Turkey; planning for small industry; current activities to support small industry; some useful principles to guide the development and operation of small industry programs; comments on the small industry programs in Turkey; an agency for small industry programs. (Author)

PB-206 968 PC A03/MF A01
Checchi and Co., Washington, D.C.
Central African Industrial Coordination Survey
Robert Manly. Jul 65, 45p TA/OST-AN-65-7-2
Contract AID/afr-292

Descriptors: *Developing countries, *Industries, *Economic development, Developing countries, Developing countries, Metals, Electric equipment, Tools, Machinery, Vehicles, Africa.

SELECTED APPROPRIATE TECHNOLOGIES

Identifiers: *Cameroun, *Central African Republic, *Chad, *Congo, *Zaire, *Gabon.

The report presents the findings and conclusions of an Industrial Coordination Survey of the Central African sub-region of Cameroun, Central African Republic, Chad, Congo, Democratic Republic of the Congo (Zaire), and Gabon. The principle objective of the study, which was done in association with the Economic Commission for Africa, was to investigate the possibilities for sub-regional harmonization of industrial development. A list of industries that appear to have a market potential in the sub-region was developed, and certain specific industries were considered in detail with respect to coordination. The report also contains a section dealing with entrepreneurship and the encouragement of industrial growth in the sub-region. (Author)

PB-206 969 PC A13/MF A01
Michigan Univ., Ann Arbor. Architectural Research Lab.

Architectural Research on Structural Potential of Foam Plastics for Housing in Underdeveloped Areas

Research rept. 1962-1965

Stephen C. A. Paraskevopoulos, Harold J. Borkin, J. Sterling Crandall, James L. Haecker, and Willard A. Oberdick. Nov 65, 295p TA/OST AN-65-11-2

Descriptors: *Houses, *Cellular plastics, *Developing countries, Houses, Structural plastics, Structural engineering, Marketing, Plastics industry, Structural forms, Structural analysis, Construction, Laminated plastics.

A feasibility study, reported in PB-206 799, established the desirability of investigating the use of foam plastics as structural materials, in the belief that such a development could contribute towards a resolution of housing problems throughout the world. This report describes a research program aimed at exploring the structural potential of these materials for housing in underdeveloped areas. A review is provided of plastics from the standpoint of physical properties, raw materials resources, production, and marketing. A detailed description is given of a structural investigation of foam plastics, and a number of demonstration structures are analytically described. (Author)

PB-206 970 PC A04/MF A01
 Battelle Memorial Inst., Columbus, Ohio. Columbus Labs.

Prefeasibility Study of an Expanded Leather and Shoe Industry in West Africa to 1980

Research rept.
Konrad Biedermann. 29 Jul 66, 57p TA/OST-AN-66-7-1

Descriptors: *Economic development, *Developing countries, *Industries, *Africa, Leather, Shoes, Industrial mobilizing.
Identifiers: *Leather industry, *Shoe industry.

Cooperative economic-development planning on a basis that includes the entire West African sub-region promises to result in an industrial development pattern that might contribute to more effective and economic utilization of African resources and to improvement in living standards. This requires, however, obtaining an overview of what a feasible industrialization pattern for specific industries within the sub-region might be over a period of 10 to 15 years. An attempt is made, in the report, to answer some of the basic questions along these lines for the leather and shoe industry in West Africa. Consideration is given to West African markets for leather and shoes, current production capabilities, feasible expansion of leather and shoe production to 1980, and the potential importance to economic development of West Africa.

PB-206 971 PC A03/MF A01
 Battelle Memorial Inst., Columbus, Ohio. Columbus Labs.

Prefeasibility Study of an Expanded Paint Products Industry in West Africa to 1980

Research rept.

Harry W. Barr, Jr. 29 Jul 66, 41p TA/OST-AN-66-7-2

Descriptors: *Economic development, *Developing countries, *Industries, *Africa, Paints, Industrial mobilizing.

Identifiers: *Paint industry.

A study was undertaken to gain an approximation of what a feasible industrialization pattern for the paint products industry in the West African sub-region would appear to be in the period up to 1980. The report provides the results of the study. Consideration is given to current markets for paint products, projected markets to 1980. Local production of raw materials and paint products, and potential importance to the economic development of West Africa.

PB-206 972 PC E01/MF A01
Miner (Thomas H.) and Associates, Inc., Chicago, Ill.

Pre-investment Study, Meat Packing Industry for Entente Guaranty Fund
Nov 67, 177 TA/OST-AN-67-11-1
Contract AID/afr-496

Descriptors: *Food industry, *Meats, *Africa, Food industry, *Livestock, Food industry, Economic analysis, Economic development, Market research, Developing countries, Investments, United States.

Identifiers: *Meat packing industry.

Livestock are among the principal resources of the West African Savanna zone, and surplus livestock have, for centuries, supplied some of the consumption needs of the populous Coastal cities many hundreds of miles to the south. It is believed that this traditional livestock trade can be rationalized principally by more slaughterhouses in the producing zone, and subsequent shipment of meat to the consuming areas. This procedure would tend to add more value to the products of the stock raising countries, while providing better and cheaper meat to consumers. Accordingly, an economic and technical analysis was undertaken aimed at inducing U. S. private investment in the livestock industry in Niger and Upper Volta to serve markets in Ivory Coast, Togo, Dahomey, Ghana, Nigeria, and other appropriate markets. Consideration was given to availability of livestock in Niger and Upper Volta, and type of existing potential consumer markets.

PB-206 976 PC E01/MF A01
Michigan Univ., Ann Arbor. Architectural Research Lab.

Factors Governing the Introduction of Foam Plastics for Housing Use in Underdeveloped Areas of the World

Stephen C. A. Paraskevopoulos, Harold J. Borkin, J. Sterling Crandall, C. Theodore Larson, and Willard A. Oberdick. Jun 66, 65 TA/OST AN-66-6-1

Descriptors: *Houses, *Cellular plastics, *Developing countries, Houses, Laminated plastics, Structural plastics, Structural engineering, Structural design, Construction, Roofs, Sheathing, Buildings.

The technical and economic feasibility of using foam plastics in housing in underdeveloped areas of the world has been established, as described in previous reports in this series. This document represents a follow-up intended to advise AID specifically on the introduction of foam plastics for housing use abroad and to report on progress of an ongoing testing program. Paper-laminated foam board gives every indication that it is a building material suitable for many different applications, and possible uses of this material in inexpensive roofing systems are described and illustrated. (Author)

PB-206 977 PC A06/MF A01
Auburn Univ., Ala. International Center for Aquacultures.

Fishculture Survey Report For West Central Africa. Increasing Fish Production by Improved Fishcultures

D. D. Moss, G. B. Pardue, and M. J. Danner. 30 Jun 69, 125p TA/OST-AN-69-6-3

Descriptors: *Aquaculture, Surveys, *Economic development, *Africa, Fisheries, Developing countries, Marketing, Research projects, Food processing, Drying, Shrimps, Shellfish, Fresh water fishes, Marine fishes.

Identifiers: Cameroon, Central African Republic, Ghana, Ivory Coast, Nigeria, Senegal, Togo.

Intensive fishculture is an effective means of producing protein of high quality. In view of this, a survey was made of the status and needs of fishculture activities in the following West Central African nations: Cameroon, Central African Republic, Ghana, Ivory Coast, Nigeria, Senegal, and Togo. Attention was given to existing programs being carried out in inland fisheries, with emphasis on fishculture projects, and to the marketing and economics of the fisheries in each country. (Author)

PB-207 132 PC A03/MF A01
Maynard (H. B.) and Co., Inc., Pittsburgh, Pa.
Feasibility of Ipecac Extraction Plant

Final rept.
Eugene H. Payne. Apr 66, 45p TA/OST-AN-66-4-1
Contract AID/csd-239, PIO/T-511-049-3-20346

Descriptors: *Edicinal plants, Drug industry, *Drug industry, Industrial plants, *Developing countries, Drug industry, Drugs, Plants(Botany), Alkaloids, Extraction, Economic development.

Identifiers: Cephaelis ipecacuanha, *Ipecac, *Bolivia.

'Brazilian' ipecac is the rhizome and root portions of the low growing vine Cephaelis (Urugoga) ipecacuanha. It is the source of emetine and several other alkaloids. The report presents the results of a study undertaken to determine the feasibility of establishing facilities to distill ipecac in Bolivia. It was found that such a facility would be economically sound only under one or both of two conditions: (1) that the cultivation of the source plant be encouraged; and (2) that it be operated in conjunction with the extraction of other products, such as coccilana, achioite, and cinchona.

PB-207 192 PC A04/MF A01
Geological Survey, Washington, D.C.
Techniques for Assessing Water Resources Potentials in the Developing Countries, with Emphasis on Streamflow, Erosion and Sediment Transport, Water Movement in Unsaturated Soils, Ground Water, and Remote Sensing in Hydrologic Applications

Preliminary rept.
George C. Taylor, Jr. Dec 71, 73p
Grant PASA-TA(1C)-9-72

Descriptors: *Water resources, Developing countries, *Hydrology, Research, Stream flow, Soil erosion, Sediment transport, Ground water, Remote sensing, Probes, Soil water.

The preliminary report describes techniques for assessing water-resource potentials in the developing countries, most of which lie in the tropics. Techniques or methodology for measuring or evaluating hydrologic parameters are described in the categories of streamflow, erosion and sedimentation, water movement in unsaturated soils, ground water and remote sensing in hydrologic applications. Selected bibliographies of each of these categories are included. (Author)

PB-207 385 PC A07/MF A01
Inter-American Geodetic Survey, Fort Clayton, Canal Zone. Natural Resources Div.
Natural Resources-Cadastral Inventory, Nicaragua Pilot Project

Report for 1965-1966.
Mar 66, 126p TA/OST-AN-66-3-1

Descriptors: *Land surveys, *Nicaragua, *Developing Countries, Natural resources, Geology, Geo-

SELECTED APPROPRIATE TECHNOLOGIES

morphology, Climatology, Hydrology, Soils, Land use, Land titles, Developing countries. Identifiers: Cadastral surveys.

In preparation for a comprehensive cadastral and natural resources survey of Nicaragua, a pilot survey was undertaken in an agricultural area in the vicinity of Leon. The primary purpose was to provide orientation for those Nicaraguan specialists expected to occupy leading roles in the planning and execution of the comprehensive survey. This report presents a description of the geology, geomorphology, climatology, hydrology, soils, land use, and cadastral aspects of the region as determined by the survey. (Author)

PB-207 393 PC A05/MF A01
National Association of State Universities and Land Grant Colleges, Washington, D.C.

The Institutional Development Agreement. A New Operational Framework for A.I.D. and the Universities

Jan 70, 96p TA/OST-AN-70-1-3

Descriptors: *Grants, *Universities, *Economic development, *Developing countries, Projects, Agreements.

Identifiers: Technical assistance, Agency for International Development.

This is the report of a joint committee of the National Association of State Universities and Land Grant Colleges (NASULGD) and the Agency for International Development (A.I.D.). The committee was asked to consider and recommend measures to improve operating arrangements between A.I.D. and the universities, including possible arrangements for experimental types of A.I.D. grants to universities for overseas technical assistance projects. The committee paid special attention to a type of development activity for which American colleges and universities are especially well suited - the multi-year technical assistance project designed to aid in the establishment or improvement of educational and research institutions in less developed countries.

PB-207 400 PC A04/MF A01
National Science Foundation, New Delhi (India). Science Liaison Staff.

Science Education Improvement Project

1970, 71p TA/OST-AN-70-13-1

Descriptors: *Education, *India, *Developing countries, Education, Programmed instruction, Developing countries, Research, Schools, Project planning, Improvement, Classifications.

Identifiers: Science education, *Curriculum development.

The report covers the activities of the Indian Science Improvement Project during the calendar year 1970. The major emphasis is on curriculum development activities. Topics covered include elementary and secondary school science programs, travelling science workshop, college science improvement program, special college/university programs, technical education, binational conferences, teaching aids, and participant training.

PB-207 491 PC A17/MF A01
Volunteers for International Technical Assistance, Inc., Schenectady, N.Y.

Village Technology Handbook
May 70, 382p TA/OST-AN-70-5-1

Descriptors: *Community development, Rural areas, *Developing countries, Handbooks, Economic development, Crafts, Water resources, Sanitary engineering, Irrigation, Roads, Construction materials, Food, Snails, Washing, Heating. Identifiers: Village technology.

Village development takes on special importance in the light of the fact that 80% of those who live in less developed countries live in villages. This handbook is aimed at helping villagers to master the resources available to them. The general topics covered include water transport; storage, and purification, latrines, bilharziasis control, irrigation and road-building, poultry raising, silage, stor-

ing food at home, storing vegetables and fruit for winter use, how to salt fish, concrete construction, bamboo construction, glues, solar water heater, washing machines, cookers and stoves, home soap making, and bedding.

PB-207 495 PC A17/MF A01
Agency for International Development, Washington, D.C. Office of Science and Technology.
Science, Technology, and Development. Volume I. Natural Resources. Energy, Water, River Basin Development
1962, 381p TA/OST-AN-62-13-1
See also Volume 3, PB-207 496.

Descriptors: *Economic development, *Developing countries, *Natural resources, Developing countries, Electric power, Cooperation, Rural areas, Coal mining, Fuels, Crude oil, Refineries, Water supply, River basin development, Energy, Reviews, Meetings.

The document is volume one of a twelve volume series containing papers of U.S. origin which were submitted at a conference on the Application of Science and Technology for the Benefit of Less Developed Areas, held in Geneva in 1963. It includes the following papers: Electrical distribution grid design and construction for rural areas, The REA program and the role of rural electric cooperative, TVA's experience with a power utilization program for rural areas, Some problems in initiating power supply in less developed areas, Rural electrification and rural development, Typical problems in the development of modern power supply in less developed areas, Practical application of coal mining technology, Metallurgical, domestic, and industrial utilization of low-rank coals, Auxiliary injected blast furnace fuels, Financing oil expansion, Economics and design of smaller petroleum refineries.

PB-207 496 PC A12/MF A01
Agency for International Development, Washington, D.C. Office of Science and Technology.
Science, Technology, and Development. Volume III. Agriculture
1962, 273p TA-OST-62-13-3
See also Volume 4, PB-207 497.

Descriptors: *Economic development, Developing countries, *Agriculture, Developing countries, Reviews, Labor relations, Farms, Management planning, Food habits, Nutrition, Meetings, Dietetics, Fisheries, Irrigation, Soil science, Plant genetics, Plant diseases, Pest control.

The document on agriculture is Volume 3 of a twelve volume series on science and technology in developing countries. It includes the following papers: Organizing for Agricultural Development; Tenure of farms; Motivation, productivity, and efficient use of labor, land and capital; Agricultural-Industrial Development, Effective Communication, Improving management in agricultural development, Meeting human needs through agricultural and food practices, Changing dietary and health practices, International cooperation in nutrition, research and planning; The evolution of soil science, Irrigation as a modern science, Plant genetics in increasing food production, Understanding and Control of Plant Diseases, and Protection from Insect and Vertebrate Pests.

PB-207 497 PC A09/MF A01
Agency for International Development, Washington, D.C. Office of Science and Technology.
Science, Technology, and Development. Volume IV. Industrial Development
1962, 199p TA/OST-AN-62-13-4
See also Volume 5, PB-207 498.

Descriptors: *Economic development, *Developing countries, *Industries, Developing Countries, Reviews, Policies, Financing, Marketing, Research, Iron and steel industry, Food processing, Wood products, Computer programming, Sociometrics, River basin development. Identifiers: Technology.

Volume 4 of a twelve volume series on science and technology in developing countries includes

the following papers: Policy considerations in expanding industrial development, Creating a practical industrial development program, Adequate capital for industrialization; Planning Management in Industrializing Countries, Small and medium industry in development, Markets as a basis for industrial development; Integrated river-basin development and industrialization; The research institute as a key industrial development instrument, the Computer and High-Speed Information Processing industrial development; The iron and steel industry in a developing economy, Food processing and the developing society, and the forest products industry in economic development.

PB-207 507 PC A17/MF A01
Basin Electric Power Cooperative, Bismarck, N. Dak.
Rural Housing Manual
William A. Schott, Mar 71, 378p*
Sponsored in part by the Department of Housing and Urban Development, Washington, D.C.

Descriptors: *Residential buildings, *Rural areas, *Regional planning, *Manuals, Community development, Surveys, Project planning, Financing, Cooperation, Legislation, Land use, Classifications, Management planning. Identifiers: Housing cooperatives.

The key to success in a housing program lies in the ability and desire of the local rural leadership to attain good low-cost housing. To accomplish this goal, personnel must be adequately informed and trained. It is intended that this training manual, along with technical assistance will provide rural electric cooperatives with the information they need.

PB-207 520 PC A18/MF A01
California Univ., Berkeley, Inst. of Transportation and Traffic Engineering.
Opportunities for Cost Reduction in the Design of Transport Facilities for Developing Regions
1970, 403p TA/OST AN-70-12-2
Contract DOT-OS-A9-004

Descriptors: *Transportation, *Developing countries, *Cost engineering, Transportation, Roads, Design standards, Cost analysis, Construction, Savings, Air transportation, Waterway transportation, Ground vehicles, Economic models.

The document provides the results of an examination of traditional designs of transport facilities in the developing countries with a view to reducing total initial and/or operating costs, or to reducing costs devoted to the imported elements. The topics include: road cost analysis and design standards; road construction cost model; a road maintenance cost model; opportunities for cost savings in highway engineering design; economics of one-way bridging; potential cost savings in the design of water crossings; potential cost savings in the design and use of ground vehicles; opportunities for cost reductions in aircraft, airways, and airports; potential cost-savings in the selection of waterway and harbor techniques; harbors and associated facilities; economic models for choice of transport techniques in developing countries; trade-offs between construction costs and maintenance costs.

PB-207 534 PC A04/MF A01
Council for International Progress in Management (USA), Inc., New York.
Report of Management Training Specialists Team, Brazil
Rept. for 31 Aug-12 Dec 64
Robert C. Dietrick, Louis C. McAnly, and James W. Quigg, Dec 64, 57p TA/OST-AN-64-12-2
Contract PIOC/T-512-40297

Descriptors: *Industrial management, *Management training, *Brazil, Economic development, Developing countries, Brazil, Project planning, Organization theory.

The document summarizes the activities of a management training team which was assigned the responsibility of working with trainers of managers in 15 Productivity Centers in Brazil, of demonstrating

SELECTED APPROPRIATE TECHNOLOGIES

improved techniques at the local plant level, of giving consultation and advice to productivity institutions on organization and activities programs, and of giving assistance to other management development institutions in Brazil. The program at each Center consisted of round-table discussions, plant visits, case study solutions, and the use of all other modern techniques to develop a local nucleus of management experts for the expansion and multiplication of Brazilian institutional self-help efforts.

PB-207 613 PC A06/MF A01
 Corps of Engineers, Washington, D.C.
Report on Potential Growth of Aquatic Plants of the Lower Mekong River Basin, Laos-Thailand
 Mark L. Nelson, Edward O. Gangstad, and Donald E. Seaman. Feb 70, 125p TA/OST-AN-70-2-1

Descriptors: *Aquatic weeds, River basins, *River basin development, Developing countries, Multiple purpose reservoirs, Weed control, Irrigation canals, Plant growth, Laos, Thailand.
 Identifiers: *Pa Mong project, Mekong River.

The Pa Mong project is a hydroelectric power and irrigation system on the Mekong River, in Laos and Thailand. Concern has been expressed as to what extent aquatic vegetation, such as water hyacinth, will interfere with the operation and maintenance of the project. This document is the report of a team that was assembled to assess problems, evaluate present methods of dealing with these problems, and make design and research recommendations relevant to multi-purpose water resource projects in the Lower Mekong Basin. Included in the report are a section on growth potentials describing a number of local factors bearing on the aquatic weed problem. (Author)

PB-207 618 PC A04/MF A01
 Lyon Associates, Inc., Baltimore, Md.
Usage Manual for Sampling and Testing Laterite and Lateritic Soils and Other Problem Soils of Africa
 1971, 72p TA/OST-AN-71-6-2
 Contract AID/csd-2164
 Prepared in cooperation with Building and Research Institute, Kumasi, Ghana.

Descriptors: *Soil tests, Africa, *Roads, *Developing countries, Identifying, Sampling, Laterites, Manuals.
 Identifiers: *Lateritic soils.

Soil testing is an important and integral part of highway design and construction. This manual has as its purpose the provision of basic details on: identifying the various soils; the laboratory equipment required to perform the tests; exploration and sampling techniques for soils; and laboratory test procedures. The format is straightforward and simple with many illustrations provided. It is expected that even inexperienced engineers and technicians will find the manual relatively easy to use in the field. (Author)

PB-207 619 PC A04/MF A01
 Department of Housing and Urban Development, Washington, D.C. Office of International Affairs.
Planning Sites and Services Programs. Ideas and Methods Exchange No. 68
 Alfred P. Van Huyck. Jul 71, 75p TA/OST-AN-71-7-1

Descriptors: *Residential buildings, Site surveys, *Project planning, *Developing countries, Urbanization, Policies, Neighborhoods, Foreign countries, Socioeconomic status.
 Identifiers: Low income families, Lessons learned, Dwelling services projects.

Housing sites and services projects are not a new idea, but the adoption of the concept on a massive scale is only just now gaining credibility as the most feasible method for dealing with the vast numbers of low-income people seeking land and shelter in the developing world. This document analyzes reasons that sites and services projects should be a major part of the urbanization program

of the developing countries. It also discusses the lessons to be learned from previous worldwide experience with the sites and services concept. A method is proposed for planning the sites and services project, and suggestions are given as to how the individual project should be viewed in the context of a national program.

PB-207 625 PC E01/MF A01
 Educational Development Center, Newton, Mass.
A Comparison Study for Evaluating Primary School Science in Africa
 Eleanor R. Duckworth. Oct 71, 60 TA/OST-AN-71-10-1
 Contract AID/csd-772

Descriptors: *Education, *Developing countries, *Africa, Education, Performance evaluation, Schools.
 Identifiers: *Science education, Primary schools.

The African Primary Science Program has been developed in eight different African countries and is currently in the initial stages of implementation in these countries. The program differs from conventional science teaching in that it attempts to provide an opportunity for children to know the world on their own terms. Its goals are to equip children with the basis for having their own ideas of interesting ways to use materials that are available to them, of having interesting questions to ask about things, and of ways to go about answering their questions. The report provides an evaluation of the program. In the process, it describes an evaluation methodology which involves the observation of various aspects of children's activity, alone and in groups, in a manner which is conducive to an understanding of what is actually happening.

PB-207 626 PC A07/MF A01
 Utah State Univ., Logan. Office of International Programs.
Rural Industrial Technical Assistance (RITA)
 Lawrence C. Taylor, Dalton Andrade, Robert Collier, and George Seely. Jul 71, 129p TA/OST-AN-71-7-2
 Contract AID/la-291
 Prepared in cooperation with the Federal University of Rio Grande do Norte (Brazil).

Descriptors: *Industries, Developing countries, *Developing countries, *Economic development, Training, Selection, Project planning, Cost analysis, Brazil.
 Identifiers: RITA project.

Project RITA (Rural Industrial Technical Assistance), Rio Grande Do Norte, was a program designed to provide assistance in industrial development to selected areas in the interior of the State of Rio Grande Do Norte. The project team consisted of professors and graduate students from the Federal University of Rio Grande Do Norte and from Utah State University. Their efforts involving the study, selection, planning, organization, and establishment of small and medium sized businesses in the project area are reported in this document. (Author)

PB-207 628 PC A06/MF A01
 Education Development Center, Newton, Mass.
Beginning Science Curriculum for English Speaking Tropical Africa (African Primary Science Program)
 Final rept., 1960-71.
 1 Dec 71, 125p TA/OST-AN-71-12-1
 Contract AID/csd-772

Descriptors: *Education, *Developing countries, *Africa, Education, Ghana, Kenya, Malawi, Nigeria, Sierra Leone, Tanzania, Uganda.
 Identifiers: *Science education, Curricula.

The African Primary Science Program, which was established in 1960 as part of the African Education Program, has operated widely in English-speaking African countries. Science centers have been established with program assistance in seven of these: Ghana, Kenya, Malawi, Nigeria, Sierra Leone, Tanzania, Uganda. Its goals have been centered on changes in Pedagogy, but it has also sought to influence the role of education in

developing countries. The report records and documents the Program's development, its changing structure, and its efforts to respond to the needs of the countries involved and developing African initiative.

PB-207 636 PC A14/MF A01
 Lyon Associates, Inc., Baltimore, Md.
Laterite and Lateritic Soils and Other Problems Soils of Africa. Development of Engineering Standards and Criteria for the Usage of Laterite, Lateritic Soils, and Other Problem Soils in Connection with the Construction of Roads, Highways and Airfields
 Jun 71, 308p TA/OST AN-71-6-1
 Contract AID/csd-2164

Descriptors: *Soil properties, *Africa, *Roads, *Developing countries, Laterites, Clay soils, Soil stabilization, Tropical regions, Ghana.
 Identifiers: *Lateritic soils.

Roadway design practices in the tropics have evolved, by and large, from American and European experience. The adequacy of these procedures, which were devised through experience with temperate zone soils, have never really been evaluated for the climatic conditions, the soils, and the traffic patterns of tropical Africa. It was therefore decided that lateritic materials, so plentiful in tropical areas, should be studied in a thorough research program. This document represents the results of such a study carried out in tropical Africa, with emphasis on Ghana. A review of the pertinent literature is provided for both lateritic soils and tropical black clays, and the engineering properties of both types are described. (Author)

PB-207 647 PC A10/MF A01
 International Rice Research Inst., Los Baños, Laguna (Philippines).
Agricultural Equipment Development Research for Tropical Rice Cultivation
 Semianual progress repts. nos. 10, 11, 12, 13, 1 Jan 70-31 Dec 71
 Amir U. Khan, Fred E. Nichols, and J. Bart Duff. 31 Dec 71, 207p TA/OST-AN-71-12-2
 Contract AID/csd-2541

Descriptors: *Agricultural machinery, Developing countries, Rice, Cultivation, Tropical regions.
 Identifiers: Rice cultivation.

The document deals with efforts toward the design, development, and extension to commercial manufacturers of power-driven equipment suitable for use in the production and processing of rice under tropical conditions. Emphasis has been placed on the development of equipment for use by farmers in the 2- to 10-hectare size category, and which can be fabricated within the countries of the region employing locally available resources and manpower to the maximum extent possible. (Author)

PB-207 812 PC A03/MF A01
 Virginia Polytechnic Inst. and State Univ., Blacksburg.
Wood In the Construction of Mass-Produced Houses
 Geza Ifju, and E. George Stern. Aug 71, 28p

Descriptors: *Structural members, *Structural timber, *Residential buildings, Mass production, Mechanical properties, Strength weight ratio, Life(Durability), Cost engineering, Foundations, Structural design.
 Identifiers: Low cost housing.

The properties and characteristics of wood, that are important in its engineered use in building and construction and, especially, in the mass-production of low-cost houses, are presented in an up-to-date approach by means of specific examples in a two-part presentation: Part I deals with the properties of wood which make it especially suitable for construction. The principal topics covered are strength-weight relationships and durability. Part II covers recent developments in the use of wood in the prefabrication and mass production of low-cost houses with particular reference to their foundations.

SELECTED APPROPRIATE TECHNOLOGIES

- PB-207 862** PC-GPO/MF A01
 Department of Transportation, Washington, D.C.
Preparation and Appraisal of Transport Projects
 Rept. for 1964-65
 Jun 68, 107p TA-OST-AN-68-6-1
 Paper copy available from GPR \$1.25 as Stock No.
 TD1.2:T68/6.
- Descriptors: *Developing countries, *Transportation management, Project planning, Evaluation, Handbooks, Concepts, Methodology, Economic analysis, Engineering standards, Traffic, Systems analysis, Benefit cost analysis, Decision making.
- The report is drawn largely from existing economic and engineering knowledge to provide a guide for making transport investment decisions in the less developed countries. Specific topics include specifying transport problems and identifying alternative courses of action, design of a transport study, analysis of present and potential traffic, capacity of an existing transport system, estimating benefits from transport investments, appraisal of costs and determination of alternative technical solutions, and decision criteria for choosing among alternative investment possibilities.
- PB-207 980** PC A02/MF A01
 Road Research Lab., Crowthorne (England).
A Review of Rural Traffic-Counting Methods in Developing Countries
 J. D. G. F. Howe. 1972, 25p Rept no. RRL-LR427
- Descriptors: *Traffic surveys, Developing countries, *Vehicular traffic, Rural areas, Counting, Data acquisition, Reviews, Questionnaires, Methodology, Automation, Recommendations.
 Identifiers: Traffic counting methods.
- The report reviews methods of rural traffic counting currently used in developing countries and examines the accuracy of the resulting flow estimates. The results of a questionnaire survey among a sample of developing countries suggest that decisions on the duration, frequency, and timing of counts are at present arbitrary. It is suggested that for increase in the accuracy of rural traffic estimates automatic traffic counters be used on a wider scale than at present.
- PB-208 432** PC A16/MF A01
 Agency for International Development, Washington, D.C. Office of Science and Technology.
Science, Technology, and Development, Volume II. Natural Resources. Minerals and Mining, Mapping and Geodetic Control
 1962, 362p TA-OST-AN-62-13-2
 See also Volume 1, PB-207 495 and Volume 3, PB-207 496.
- Descriptors: *Natural resources, *Developing countries, *Mineral deposits, *Economic development, Geological surveys, Government policies, Organizations, Project planning, Mining engineering, Regional planning, Pakistan, Chile, Mexico, Processing, Mapping.
- The volume includes the following papers: Government as a dynamic agent in mineral resource development, The role of national geological surveys in mineral resources development, The importance of a central mines bureau in fostering development of mineral resources, Legislative choices in the development of mineral resources, Development organization and operation of the Institute in Chile, Opportunities for regional organization in mineral resources development, A cooperative program in Pakistan, In-service and university training of geologists and mineral engineers, Non-metallic mineral resources for fertilizers, Regional heavy-mineral reconnaissance for ore deposits in deeply weathered areas with semi-humid to humid and temperate to tropic climate.
- PB-208 550** PC A04/MF A01
 National Academy of Sciences, Washington, D.C.
Solar Energy in Developing Countries: Perspectives and Prospects
 Mar 72, 60p TA-OST-NAS-72-34
 Contract AID/csd-2584
- Descriptors: *Solar energy, *Developing countries, Solar power generation, Utilization, Evaporation, Heating, Drying, Distillation, Air conditioning, Refrigerating, Direct energy conversion.
- This is a report of an ad hoc Advisory Panel, made up of specialists from the United States and abroad, to: (1) Assess the state of the art in utilizing solar energy for developing countries and review current practical applications; (2) identify promising areas for research and development; and (3) examine the desirability of establishing an international solar energy institute in North Africa, to carry out solar energy research and development.
- PB-209 172** PC A02/MF A01
 Water Resources Council, Washington, D.C.
Summary: Federal Agency Technical Comments on the Special Task Force Report Entitled 'Procedures for Evaluation of Water and Related Land Resource Projects'
 Final rept.
 Jul 70, 17p Rept no. US-WRC-0088
- Descriptors: *Water resources, Management planning, Project planning, Economic development, Regional planning, Social welfare, Cost analysis, Accounting, Research management, Reviews.
- The report contains a condensation of and blending without evaluation of the technical comments by the various agencies. (Author)
- PB-209 175** PC A03/MF A01
 Water Resources Council, Washington, D.C.
Principles for Planning Water and Land Resources
 Final rept.
 Jul 70, 31p Rept no. US-WRC-0091
- Descriptors: *Water resources, Management planning, *Natural resources, Management planning, Economic development, Regional planning, Social welfare, Benefit cost analysis, Standards, Cost estimates.
- The report discusses principles to provide a broad policy framework for planning activities and including the conceptual or theoretical basis for planning. (Author)
- PB-209 176** PC A13/MF A01
 Water Resources Council, Washington, D.C.
Standards for Planning Water and Land Resources
 Final rept.
 Jul 70, 296p Rept no. US-WRC-0092
- Descriptors: *Water resources, Management planning, Standards, Benefit cost analysis, Cost comparison, Economic development, Water supply, Flood control, Social welfare.
- The document is a report on Standards to provide uniformity and consistency by comparing, measuring and judging benefits, costs, and alternatives. (Author)
- PB-209 177** PC A10/MF A01
 Water Resources Council, Washington, D.C.
A Summary Analysis of Nineteen Tests of Proposed Evaluation Procedures on Selected Water and Land Resource Projects
 Final rept.
 Jul 70, 212p Rept no. US-WRC-0093
- Descriptors: *Water resources, Management planning, Abstracts, Tests, Regional planning, Standards, Project planning, Economic development, Cost analysis.
- The tests pointed up many areas in the report of June 1969, where ambiguities existed and further clarification was required. Test results substantiated that the June report was concerned primarily with concepts and included only a few standards and procedures to implement them. Tests have indicated that the multiobjective approach to planning is practical. (Author)
- PB-210 105** PC A08/MF A01
 Agency for International Development, Washington, D.C. Office of Science and Technology.
The Role of the Agency for International Development in the Field of Natural Resources Planning and Management
 Apr 72, 153p Rept no. TA/OST-72-8
- Descriptors: *Natural resources, Management, *Developing countries, Economic development, Meetings.
 Identifiers: *Natural resource management.
- The report is one of the results of a Workshop on Natural Resource Planning and Management which was held on 21 January 1972 at Washington, D. C. It describes the key issues, significant observations, and major findings and conclusions which emerged from that session, as well as from documentation presented by U. S. technical agencies and multilateral institutions both in advance of and subsequent to the workshop. Some of the subjects covered include: Significance of natural resources to economic growth; constraints on natural resources development; current role of governments, development assistance agencies, and private industry; special capabilities of the United States for international assistance; activities and perspectives of U. S. technical agencies and international development institutions. (Author)
- PB-210 128** PC A21/MF A01
 Cornell Univ., Ithaca. Center for Housing and Environmental Studies.
Research Methods for Housing and Urbanization Studies in Developing Countries
 Margaret E. Woods, and Earl W. Morris. 30 Jun 69, 479p TA-OST-AN-69-6-5
 Contract AID/csd-817
- Descriptors: *Residential buildings, *Puerto Rico, *Urban development, Latin America, *Demographic surveys, Developing countries, Research, Sociometrics, Economic factors, Political systems, Family relations, Socioeconomic status, Improvement, Project planning.
 Identifiers: San Juan(Puerto Rico).
- A pilot study of urban housing was undertaken in San Juan, Puerto Rico, to design and test methodological tools for the conduct of housing research in the urban areas of Latin America. Social, economic, demographic, and political aspects of urban housing were studied, and the document is based on the findings of that study. The first portion provides a broad survey of methods of survey research and their applicability to the conduct of sample surveys in the urban areas of developing nations. Next, methodology and techniques are presented for measuring housing characteristics and quality, socioeconomic and demographic characteristics of families, attitudes, aspirations, and value orientations with respect to housing, and two means by which a housing situation may be improved.
- PB-210 129** PC A03/MF A01
 Department of Housing and Urban Development, Washington, D.C. Div. of International Affairs.
Prolonging Life of Wood in Houses
 Ideas and methods exchange
 J. Robert Dodge. Jun 67, 43p IME-47, TA/OST-AN-67-6-1
 Revision of reports dated Jul 63 and Dec 57.
- Descriptors: *Wooden structures, *Wood preservatives, *Wood preservatives, Residential buildings, Tropical regions, Protection, Curing, Damage, Termites, Coal tar, Creosote, Phenol, Naphthenates, Copper organic compounds, Chlorine aromatic compounds, Drying, Poisons.
 Identifiers: Wood preservation, Phenol/Pentachloro, Copper naphthenates.
- Dwellings constructed entirely or in part of wood frequently deteriorate rapidly due to readily avoidable errors in the design of the structures and in the curing, use, or protection of the wood. This is especially true in the humid tropical areas with a high incidence of insect infestation. This document contains the most widely accepted information on the protection of wood. It is intended to serve as a reference and check list for housing technicians.

SELECTED APPROPRIATE TECHNOLOGIES

The topics include: Sources of damage; protection against damage; wood preservatives; methods of treatment; soil poisons; air drying lumber; boilerless dry kilns; drying by solar radiation. (Author)

PB-210 130 PC A03/MF A01
 Michigan State Univ., East Lansing.
Care and Maintenance of Farm Machinery. A Handbook for Farm Operations In Tropical Agriculture Areas
 Norwin Braun. Jun 68, 49p TA/OST-AN-68-6-2
 Prepared in cooperation with Nigeria Univ., Nsukka.

Descriptors: *Agricultural machinery, *Handbooks, *Developing countries, Agricultural machinery, Maintenance, Farms, Safety, Preventive maintenance, Tropical regions.

A functional farm workshop is a most valuable asset to any university farm. It is even more important in developing countries that are remote from ready access to machinery replacements, spare parts, and company field men. In order to keep machinery in the best working condition, a thorough preventive maintenance program must be developed and closely adhered to. This handbook is intended as a guide for such a program. The first portion concerns itself with farm machinery safety; this is followed by a discussion of the structure and role of the mechanic section of a farm operations department. (Author)

PB-210 138 PC A04/MF A01
 Jordan (Roy E.), Jr.
The Ceramics Industry in Thailand 1970
 Oct 70, 72p TA/OST-AN-70-10-1
 Contract AID/ea-118

Descriptors: *Industries, *Ceramic materials, *Thailand, Ceramic materials, Economic development, Developing countries, Manufacturing, International trade.

The ceramic industry of Thailand is just beginning to emerge as an economic force in the kingdom. The rapid growth of the ceramic market in Thailand has led to marked expansion in domestic production and has attracted large joint venture investments in manufacturing facilities for ceramic products formerly imported. This report reviews available data and information on Thailand's ceramic industry and trade. Included is information on existing ceramic enterprises as well as approved or planned industrial projects. Sources, relative prices, and the volume of imports are discussed, as well as other aspects of the growth potential in the ceramic sector. Data are also included on raw materials and their locations in the kingdom. A preliminary identification is made of investment opportunities. (Author)

PB-210 332 PC A12/MF A01
 National Inst. of Community Development, Hyderabad (India).
Development and Change In a Bengal Village
 Research rept.
 Ajit Kumar Danda, and Dipali Ghosh Danda. May 68, 266p RR-20, TA/OST-AN-68-5-2
 Report on the Diffusion of Innovations in Rural Societies. Prepared in cooperation with Michigan State Univ., E. Lansing. Dept. of Communication.

Descriptors: *Social change, *India, *Social communication, *Developing countries, Attitudes, Agriculture, Community relations.
 Identifiers: West Bengal (India), Technological change.

The report presents a study of the process of planned change in a village of West Bengal, India. It describes in general terms the positive and negative reactions of farmers toward specific agricultural programs. The special emphasis is on the determination of the causes of rejection of an improved agricultural practice. The communication process of conveying modern ideas and practices to the villagers was also examined. The report describes the physical setting of the village, community structure, development and change, and adoption of innovations. (Author)

PB-210 507 PC E01/MF A01
 Department of Housing and Urban Development, Washington, D.C. Div. of International Affairs.
Plant Requirements for Manufacture of Wallboard
 Jun 67, 63 TA/OST-AN-67-6-2

Descriptors: *Wallboard, Manufacturing, *Industrial engineering, Wallboard, Industrial plants, Developing countries, Operating costs, Requirements, Economic analysis.

The term 'wallboard' is applied to those construction materials which may be made from one of several types of fibrous residues, including bagasse, cereal straws, and cornstalks. These sheets are used in many ways in building construction, and the raw materials of which they can be made are to be found all over the world. This document provides a guide for the establishment and operation of a wallboard manufacturing plant. The topics covered include: Principles of wallboard manufacturing; the manufacturing process; building requirements; materials requirements; equipment requirements; labor requirements; overhead rate; unit cost of manufacturing; capital requirements; sales revenue; and projected profit and loss. Detailed operation sheets are given for each major step in the manufacturing process. (Author)

PB-210 508 PC A04/MF A01
 National Inst. of Community Development, Hyderabad (India).
Communication In India. Experiments In Introducing Change
 Joseph E. Kivlin, Prodipto Roy, Frederick C. Fliegel, and Lalit K. Sen. May 68, 64p TA/OST-AN-68-5-1

Descriptors: *Social communication, *India, *Social change, *Developing countries, Literacy, Education, Radio communication.
 Identifiers: Technological change.

An often encountered difficulty experienced by development programs involves gaining acceptance of beneficial changes by the populace. This document reports the results of a communication experiment which attempted to induce adoption of modern agricultural, health, and family planning practices by the inhabitants of a number of villages near Lucknow, Uttar Pradesh, India. The study sought to evaluate the continuing effects of two communication treatments: radio farm forums, and literacy training classes. The results indicate that while knowledge of the practices spreads rather quickly, adoption is slow and at low levels. Some progress was made, however, and clear cut differences in the effectiveness of the communication treatments were exhibited. (Author)

PB-210 574 PC A07/MF A01
 Westinghouse Research Labs., Pittsburgh, Pa.
Program to Develop Useful Artificial Heart and Ventricular Assist Devices. Volume III
 Final rept. Jan 70-Jun 71
 J. N. Helfer, L. C. Vercellotti, P. J. Hite, V. L. Gott, and J. M. Evans. Jun 71, 137p PH-43-67-1139-3-3
 Contract PH-43-67-1139
 Revision of report dated Dec 69. See also Annual report dated Jan-Dec 70, PB-197 252, and Volume 2, PB-210 573.

Descriptors: *Mechanical hearts, Maintenance, *Mechanical organs, Design, Heart, Cardiovascular system, Physiology, Blood pressure, Blood circulation, Aorta, Evaluation, Quality control.
 Identifiers: Intraaortic balloon devices, *Cardiac assist devices, Biomaterials.

The objectives of the program are the continued development of a safe, simple, reliable, and effective intra-aortic balloon assist device. Four tasks are defined to carry out these objectives including balloon development and testing, device improvement, physiological testing, design of a clinically acceptable device, and providing specifications, drawings, and assistance to the Medical Devices Applications Program. Volume I reports in detail the progress achieved under these tasks. Volume II describes in detail the calibration, setup, and op-

erating procedure for Units 001 to 040. Volume III is the Maintenance Manual for the devices.

PB-210 592 PC A21/MF A01
 Battelle Memorial Inst., Columbus, Ohio. Columbus Labs.
Transportation Technology for Development. Volume I
 E. S. Cheaney, R. D. Leis, and D. M. Landreman. Feb 68, 488p TA/OST-AN-68-2-1
 Contract AID/csd-762
 See also Volume 2, PB-210 593.

Descriptors: *Developing countries, *Transportation, Management, Construction, Manpower, Capacity, Vehicles, Maintenance, Economic development, Pipeline transportation, Highway transportation, Rail transportation, Air transportation, Water transportation, Passenger transportation, Cargo transportation.
 Identifiers: *Technology, Modal choices, Intermodal cargo transportation.

This report provides background information on the technology of various transportation modes and their capabilities. It is intended primarily for use by economists, program officers, general engineers, and others in the economic development field. Information is included on the broad capacities of particular modes to handle freight and passenger traffic; major features and the advantages and limitations of each mode in terms of technical capabilities; levels of technological sophistication that can be adopted within each mode; and the 'inputs' of right-of-way preparation and construction, materials, vehicles, equipment, maintenance, and manpower required at each level to produce an 'output' of transport service. Volume One contains sections on: Intermodal factors of choice in transportation; highway transportation; railway transportation; conventional air transportation; V/STOL aircraft; inland waterway transportation; oceanway transportation; pipeline transportation; and intermodal freight exchange.

PB-210 593 PC A12/MF A01
 Battelle Memorial Inst., Columbus, Ohio. Columbus Labs.
Transportation Technology for Development. Volume II
 E. S. Cheaney, R. D. Leis, and D. M. Landreman. Feb 68, 265p TA/OST-AN-68-2-2
 Contract AID/csd-762
 See also Volume 1, PB-210 592.

Descriptors: *Development countries, *Transportation, Monorail railways, Belt conveyors, Ground effect machines, Hydrofoil craft, Power supplies, Factor analysis, Cargo vehicles, Passenger vehicles.

Identifiers: Aerial tramways, Off road vehicles, Technological factors, Special purpose vehicles.

The second volume of the transportation technology for development study contains sections on: Aerial tramway transportation systems; beltway (endless moving belt) transportation systems; monorail transportation systems; air cushion (or ground effect, surface effect) vehicle transportation systems; hydrofoil transportation systems; special purpose vehicles (i.e., those capable of moving over terrain away from established route networks); new power sources and their effect on transportation technology; external technological factors (food production, water supply, mining and mineral processing, petroleum production, power generation) and their influence on transportation needs.

PB-210 594 PC A10/MF A01
 Geological Survey, Washington, D.C.
Surface-Water Resources of the Yobe River System, Northern Nigeria, 1963-68
 B. E. Colson. Jan 69, 206p TA/OST-AN-69-1-1
 Prepared in cooperation with the Government of Nigeria.

Descriptors: *Water resources, *Developing countries, *Nigeria, *Watersheds, Hydrographic surveys, Surface waters.
 Identifiers: Yobe River.

SELECTED APPROPRIATE TECHNOLOGIES

The Yobe River system, which is tributary to Lake Chad, drains an area of about 33,000 square miles in a semi-arid region of northern Nigeria. This report describes the general hydrologic features of the Yobe drainage basin and presents hydrologic data on gage heights, daily discharge, and analysis of chemical quality and sediment content of water samples for 18 stations in the system. (Author)

PB-210 595 PC A03/MF A01
National Fertilizer Development Center, Muscle Shoals, Ala.
Economic Comparison of Overseas Manufacture and Importation of Anhydrous Ammonia
Mar 69, 29p TA/OST-AN-69-3-1

Descriptors: *Ammonia, *International trade, *Developing countries, Ammonia, *Fertilizers, Developing countries, Economic analysis, India, South Vietnam, Uruguay, Cost estimates, Production, Chemical engineering.
Identifiers: Imports.

Ammonia is the principal form in which fixed nitrogen is used in the manufacture of fertilizer materials. The production of ammonia by reacting hydrogen with atmospheric nitrogen is the basis of the modern nitrogen fertilizer industry. The report compares the economics in developing countries of importing ammonia from suppliers having large plants and low-cost feedstocks with those of producing the material under local conditions. Three countries, India, South Vietnam, and Uruguay, are used as a basis of the comparison. As these countries have widely divergent needs for fertilizer materials, the costs applicable to them should be representative of many other developing countries with similar needs and resources. (Author)

PB-210 596 PC A05/MF A01
Foreign Agricultural Service, Washington, D.C.
Technological Change In Agriculture. Effects and Implications for the Developing Nations
Dana G. Dalrymple. Apr 69, 88p TA/OST-AN-69-4-2

Descriptors: *Agricultural economics, *Developing countries, Mass production, Grain crops, Agricultural machinery, Policies, Economic development, Project planning.
Identifiers: Technological change.

The effects of technological changes in agriculture in the less developed countries are a matter of increasing concern. As efforts to expand agricultural production begin to pay off, the many and complex ramifications of technological change become more and more evident. This document provides an introduction to some of the major effects of technological change in agriculture. Included among the topics considered are: The nature of technological change; adoption process for agricultural technology; impact of changes in agricultural technology; high-yielding varieties of grain; mechanization of agriculture; and policy implications of technological change. (Author)

PB-210 597 PC A08/MF A01
Foreign Economic Development Service, Washington, D.C.
An Analysis of the Potentials and Prospects of Increasing Edible Oil Production In West Pakistan

Frederic A. Coffey, D. M. Yermanos, J. R. Wilcox, B. M. Waddle, and P. F. Knowles. Sep 71, 170p FEDS-Field-11, TA/OST-AN-71-9-2

Descriptors: *Vegetable oils, *Developing countries, Production, Cottonseed, Soybeans, Peanuts, Safflower oil, Sesame oil, Oilseeds, West Pakistan.
Identifiers: Sunflower seeds.

The report represents one phase of a study on the potential for increasing oilseed production in West Pakistan. It provides a review of research, production potential, and problems of oilseed production and processing in Pakistan and in the United States and other countries where relevant. It includes a general economic analysis as well as detailed discussions on the production of safflower, sesame, peanuts, soybeans, sunflowers, and cottonseed. (Author)

PB-211 367 PC A04/MF A01
Agency for International Development, Washington, D.C. Office of Science and Technology.
Desert Encroachment on Arable Lands: Significance, Causes, and Control
Aug 72, 61p Rept no. TA/OST-72-10

Descriptors: *Deserts, Stabilization, *Arable land, Protection, Dunes, Soil stabilization, Water table, Cultivation, Soil erosion, Soil conservation, Arid land.
Identifiers: *Desert encroachment, Dune progression, Water management.

Desert encroachment is a problem of significant economic consequence in a number of developing countries. The problem becomes more acute as population increases. The report gives an overview of the causes and significance of the problem and the state-of-the-art of control methods. It highlights causes and significance, gaps in knowledge and technology, and the nature and potential of recent efforts to control desert encroachment. (Author)

PB-211 428 PC A03/MF A01
National Fertilizer Development Center, Muscle Shoals, Ala.
Engineering Evaluation of Selected Fertilizer Production Facilities In Colombia
I. W. McCamy, and D. R. Waggoner. Aug 70, 43p Bull-Y-10, TA/OST-AN-70-8-1

Descriptors: *Fertilizers, Developing countries, *Industrial plants, Evaluation, Production methods, Flow charts, Operating costs, Investments, Blending, Handling equipment, Colombia.

The report is the result of a study by a team of experts of two segments of the Colombian fertilizer industry: (1) the facilities of Fertilizantes Colombianos, S.A. (FERTICOL), and (2) a sampling of small bulk-blending plants. The first part of the report provides general information about the fertilizer situation in Colombia. The results of the analysis of the FERTICOL plant are then presented. This includes flow diagrams of alternative production schemes, and projections of investment and operating costs. Similarly, operating problems are identified and alterations in equipment, raw materials, and procedures to improve operations are suggested for the bulk-blending plants. (Author)

PB-211 444 PC A05/MF A01
Iowa State Univ., Ames. Center for Agricultural and Rural Development.
Future Alternatives Affecting the Agricultural Demand for Water and Land: The Effects of Soy Protein Meats and Nitrogen Fertilizer Restrictions on Future Water and Land Use
Final rept.
Howard C. Madsen, Earl O. Heady, Stanley H. Hargrove, and Kenneth J. Nicol. Jun 72, 93p* NWC-F-72-054
Contract NWC-72-012

Descriptors: *Land use, *Agriculture, *Water resources, Agriculture, *Food supply, Substitutes, *Fertilizers, Utilization, Soybeans, Meat, Proteins, Nitrates, Irrigated land, Water consumption, Mathematical models, Forecasting, Linear programming.
Identifiers: Soy protein concentrate.

The study evaluates the impact on land and water needs and farm prices if either soy protein meat analogs and extenders were substituted for part of the beef consumption in the year 2000 or nitrogen fertilizer application in the year 2000 were restricted to 100 pounds per acre and 50 pounds per acre. The study is based on a large-scale linear programming model of U.S. agriculture. Results of the soy protein meats policy models indicate that with soy protein meats accepted by consumers, productive capacity of U.S. agriculture would surpass any level previously experienced in this nation. Results of the two fertilizer limitation policy models indicate that a mild restriction on the use of nitrogen fertilizer would not strain the productive capacity of U.S. agriculture. A severe restriction, however, would reduce the supply capacity of U.S. agriculture considerably. (Author)

PB-211 473 PC A04/MF A01
North Carolina Univ., Chapel Hill. Dept. of Environmental Sciences and Engineering.
Engineering Measures for Control of Schistosomiasis
Frederick E. McJunkin. Sep 70, 71p TA/OST-AN-70-9-2
Contract AID/csd-2487

Descriptors: *Schistosomiasis, Control, *Environmental engineering, Schistosomiasis, *Irrigation canals, Schistosomiasis, Water quality, Parasitic diseases, Infectious diseases, Tropical regions, Developing countries, Bibliographies.

The water-related disease schistosomiasis (or bilharziasis) infects more people today than ever before in history, perhaps as many as 200 million people. Its increasing incidence and widespread prevalence are due in large measure to tropical irrigation and hydroelectric projects, implemented by engineers. This report provides background information on schistosomiasis and its control to enable engineers to work effectively with other professionals in design and operation of schistosomiasis control programs. It also seeks to improve understanding on the part of epidemiologists, malacologists, physicians, and others of the role of engineers in control of schistosomiasis. The present status of engineering measures for schistosomiasis control is summarized, and some possible approaches and opportunities for more effective control of schistosomiasis by engineers are outlined. A bibliography of relevant publications is included.

PB-211 487 PC A03/MF A01
National Academy of Sciences-National Research Council, Washington, D.C. Office of the Foreign Secretary.
The Central American Workshop on the Environment and Development. Antigua, Guatemala, July 25-30, 1971
Jul 71, 37p TA/OST-AN-71-7-3
Contract AID/csd-2584

Descriptors: *Economic development, *Central America, *Ecology, Developing countries, Meetings, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Agriculture, Industries, Services, Regional planning, Education.

The primary goals of the Workshop were: to stimulate awareness of environmental factors in economic development among leaders in Central America; and to lay the groundwork for concerted actions within the established framework of the Common Market countries (Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua). This document records the issues discussed and the conclusions reached. The focus of the workshop was upon the industrial, agricultural, and service industry factors. Consideration was also given to the human environment (principally population pressures), to planning at the regional level, and to educational consequences of environmental problems. (Author)

PB-211 628 PC A11/MF A01
National Fertilizer Development Center, Muscle Shoals, Ala.
Training Manual for Fertilizer Plant Operators
Oct 70, 247p* Circular-Z-17, TA/OST-AN-70-10-4

Descriptors: *Fertilizers, *Chemical plants, *Manuals, Chemical plants, *Chemical engineering, Fertilizers, Operators(Personnel), Developing countries, Conveyors, Dust collectors, Weight measurement, Fork trucks, Sampling, Packagings, Pumps, Compressors, Valves, Fluid filters, Chemical reactors, Centrifugal classifiers, Commutation, Refrigerating machinery, Maintenance, Safety.

The purpose of the manual is to assist in the training of fertilizer plant operators in the developing countries. It is an effort to share with the chemical industries in these countries experience that has been obtained over many years of operation at the National Fertilizer Development Center. Simple instructions, accompanied by abundant diagrams, are provided for all types of equipment to be found in most fertilizer plants. The topics covered in-

SELECTED APPROPRIATE TECHNOLOGIES

clude: Conveyors, elevators, crushers, screens, bins, tanks, dust collectors, weighing equipment, forklifts, front-end loaders, sampling, packaging, pumps, compressors, valves, pipeline flows, filtering equipment, absorption and spray tower, agitation, overhead cranes, common instrumentation, burners, centrifuges, heating and cooling equipment, granulating equipment, neutralization and reaction equipment, concentration equipment, refrigeration equipment, preventive maintenance, lubrication, and safety. (Author)

PB-211 629 PC A04/MF A01
National Fertilizer Development Center, Muscle Shoals, Ala.
Technical and Economic Evaluation of Fertilizer Intermediates for Use by Developing Countries
 G. C. Hicks, R. D. Young, J. J. Stumpe, M. M. Norton, and M. J. Richards. Mar 70, 56p Bull-Y-3, TA/OST AN-70-3-1

Descriptors: *Fertilizers, Developing countries, International trade, Economic analysis, Liquid ammonia, Nitrogen inorganic compounds, Liquids, Phosphoric acids, Phosphorus, India, Vietnam, Uruguay.

Identifiers: South Vietnam.

In the past comparatively little emphasis has been placed on the position of fertilizer intermediates in supplying the fertilizer needs of the developing countries. This document provides an economic analysis of the prospects for fertilizer intermediates in the developing countries. An effort is made to rationalize the economic and practical examples by hypothetical planning exercises for the case of a few typical countries (India, South Vietnam, Uruguay) with large and small needs for fertilizers. The intermediates of primary concern are anhydrous liquid ammonia, low or nonpressure nitrogen solutions, phosphoric acid, and elemental phosphorous. (Author)

PB-211 639 PC A04/MF A01
National Fertilizer Development Center, Muscle Shoals, Ala.
Fertilizer Distribution In Indonesia - 1969
 John R. Douglas, Jr., Paul J. Stangle, and James E. Hawes. Feb 70, 61p Bull-Y-1, TA/OST AN-70-2-3

Descriptors: *Fertilizers, Developing countries, Distributing, Marketing Inventories, Indonesia.

During recent years chemical fertilizers have been used with ever-increasing frequency in Indonesia. This report provides the results of a study of fertilizer marketing and distribution with special reference to the operation of P. N. Pertani, a government organization which is a major distributor of fertilizers. Among the topics covered are: Organization of P. N. Pertani headquarters unit and typical field units; fertilizer stocks and accounting procedures; procedures for determining fertilizer demand; credit availability; inventory management procedures; and relationship of P. N. Pertani to private enterprise. (Author)

PB-211 640 PC-GPO/MF A01-NTIS
Forest Products Lab., Madison, Wis.
Low-Cost Wood Homes for Rural America - Construction Manual
 L. O. Anderson. May 69, 114p A/OST AN-69-5-1
 Paper copy available from GPO \$1.00 as A1.76:364.

Descriptors: *Houses, *Wood, *Construction, Manuals, Rural areas, Wooden structures, Cost factors.

Improved housing for rural families means, in many cases, a home that is low in first cost, easily maintained and equipped for good family living. This manual provides details on the construction of such housing, with special reference to methods and materials which will hold down costs, but will insure quality. It gives step-by-step information on every phase of house construction, from the construction of the foundation or supporting units to the final painting and finishing. The manual may be particularly useful to those who plan rural housing

efforts; the contractors and skilled and unskilled laborers who will be concerned with the actual construction. (Author)

PB-211 641 PC A04/MF A01
 Foreign Economic Development Service, Washington, D.C.

Food Marketing In Developing Countries

Bibliography series
 Robert W. Taylor. Dec 71, 56p TA/OST AN-71-12-3
 Also available as A.I.D. Bibliography Series-6.

Descriptors: *Food, Developing countries, Marketing, Bibliographies, Abstracts, Indexes(Documentation).

The document brings together a summary of studies on the domestic marketing of food in the less developed countries which have been done by or for the Agency for International Development. It is essentially a bibliography with an abstract provided for each bibliographic entry. The entries are arranged by general subject, by geographic region, and by commodity. A personal/corporate author index is included. (Author)

PB-211 642 PC A03/MF A01
 Auburn Univ., Ala. International Center for Aquaculture.

Proposed Cooperative Fishery Program for Ecuador
 H.S. Swingle. 25 May 71, 44p TA/OST AN-71-5-1

Descriptors: *Fisheries, *Ecuador, Projects, Aquaculture, Fishes, Shrimps, Reviews, Developing countries.

The report is a result of a survey which was undertaken to determine how the U. N. Food and Agriculture Organization and the U.S. Agency for International Development could best coordinate their fisheries programs to provide joint assistance of most benefit to Ecuador. Some of the topics discussed are: Reorganization of the Departamento de Piscicultura; soils, water, and fish in the Oriente; the coastal area near Esmeraldas; and introduced species of fishes in Ecuador. In addition, an outline is provided for a proposed coordinated fisheries program. (Author)

PB-211 643 PC A03/MF A01
 Auburn Univ., Ala. International Center for Aquaculture.

Fishculture Survey Report for Costa Rica
 R. T. Lovell, and D. D. Moss. 1 May 70, 42p TA/OST AN-70-5-2

Descriptors: *Aquaculture, *Costa Rica, Developing countries, Surveys, Fisheries, Education, Capital, Research.

The report presents observations and recommendations which are made as a result of a survey of the inland fisheries of Costa Rica. The survey was undertaken for the purpose of providing technical advice on freshwater fisheries research programs in the country and on developing programs for the production of fish for food by farmers or commercial investors. The topics covered in the report include: General conditions in Costa Rica which may affect fishculture considerations; government divisions responsible for fisheries development; fishculture research and training; and available sources of capital, land and feedstuffs. (Author)

PB-211 658 PC A06/MF A01
 Foreign Economic Development Service, Washington, D.C.

The Marketing Challenge. Increasing Production In Developing Nations
 Martin Kriesberg. Dec 70, 104p FEDS-7, TA/OST-AN-70-12-4

Descriptors: *Marketing, *Developing countries, *Food, Marketing, Meetings, Proceedings, Policies, Socioeconomic status, Project planning, Nutrition, Systems analysis, Problem solving, Surveys.
 Identifiers: Technical assistance.

Inadequate transportation and storage, poor market information, lack of capital, and other chronic marketing problems in developing countries have been dramatized by recent production increases. The document is based on a symposium which was organized to focus attention and resources on food marketing in developing nations. Topics covered include: Key considerations in marketing policies; marketing enterprises and the flow of resources into marketing functions; nutrition and marketing food for the needy; efficiency in the marketing system; regional experiences in marketing problems and priorities; and approaches to technical assistance.

PB-211 663 PC A06/MF A01
 Auburn Univ., Ala. International Center for Aquaculture.

Inland Fisheries Progress in Thailand, 1971
 H. S. Swingle, and E. W. Shell. 15 Jan 72, 117p TA/OST-AN-72-1-2

Descriptors: *Fisheries, *Thailand, *Developing countries, Fisheries, Aquaculture, Research, Project planning, Shrimps, Fresh water fishes, Parasites, Productivity, Statistical data.

The document provides a review and evaluation of the status of and the progress made by the Thailand inland fisheries program during 1971. Some of the topics covered are: Highlights of 1971 research results (village reservoir management, efficiency of various fish species, combined rice and fish culture, cage and pen culture of fish, freshwater shrimp culture); parasites affecting fish and man; problems arising in culture and marketing of Trichogaster pectoralis and Clarias Batrachus; Hatchery production and fish distribution; Department of Fisheries organization; titles of current and recently completed fisheries research projects; synopsis of physical and biological data for the fisheries units and the fisheries research stations; fisheries statistics. (Author)

PB-211 669 PC A13/MF A01

Stanford Research Inst., Menlo Park, Calif.
Marketing of Staple Food Crops In Tropical Africa: Overall Analysis and Report
 Final rept.

William O. Jones. Jun 69, 280p TA/OST AN-69-6-6
 Contract AID/csd-801

Descriptors: *Food, Developing countries, Marketing, Supply(Economics), Urban areas, Commerce, Diets, Efficiency, Subsaharan Africa, Kenya, Nigeria.

Identifiers: *Sierra Leone.

The report is an end product of a study undertaken to identify practical methods for increasing the efficiency with which staple foodstuffs are marketed in tropical Africa. It describes the structure of selected food marketing systems in tropical Africa in terms of product flow, exchange levels, personnel, and marketing; it appraises the performance of the system; and it identified measures that might be adopted to improve its efficiency. The specific subjects of the report are the trade in staple foodstuffs in the supply hinterlands of four major cities: Nairobi, Kenya; Enugu, Nigeria; Ibadan, Nigeria; and Freetown, Sierra Leone. (Author)

PB-211 671 PC A04/MF A01
 Auburn Univ., Ala. International Center for Aquaculture.

Aquacultural Developments In Peru
 D. C. Moss. 30 Apr 72, 57p TA/OST-AN-72-4-2

Descriptors: *Aquaculture, *Peru, Developing countries, Fisheries, Personnel development, Research, Peru.

As part of an overall effort to reduce the outlay of foreign exchange for the importation of beef, the Government of Peru is striving to develop to the fullest extent the country's fisheries resources. An important part of this effort involves aquaculture. This report reviews the present status of aquaculture in Peru and provides a series of recommendations for future development. Some of the topics covered include the potential for coldwater and

SELECTED APPROPRIATE TECHNOLOGIES

warmwater fishculture; a proposed project for culturing fish in pens; a proposed warmwater aquacultural research station; organizational structure of the Ministry of Fisheries; existing fisheries stations and equipment; and fisheries personnel and their training. (Author)

PB-211 672 PC A03/MF A01
Rutgers - The State Univ., New Brunswick, N.J.
Dept. of Food Science.

Corn Fortification: A Field Demonstration Model

Leonardo J. Mata, Ricardo Bressani, Paul A. Lachance, and Miguel A. Guzman. 12 Jun 71, 45p TA/OST-AN-71-6-3

Descriptors: *Nutrition, Developing countries, Corn, Additives, Nutritional deficiencies, Proteins, Experimental design, Guatemala, Central America. Identifiers: Food fortification.

Protein deficiency is a major problem in Central America, as it is in most societies throughout the world that occupy similar ecosystems. An apparent measure to correct this deficiency in utilizable protein would be to increase the production and consumption of animal protein, but the approach has very serious economic and socio-cultural limitations. A nutrition improvement approach that appears to be feasible is the fortification of a food that is normally part of the regular diet to a level sufficient to correct the protein deficiency. In the Central American countries corn, which is consumed primarily in the form of tortilla, would seem to lend itself well to this technique. This document outlines a proposed field methodology to determine the feasibility of the corn fortification approach at the community level. (Author)

PB-211 761 PC A06/MF A01
National Fertilizer Development Center, Muscle Shoals, Ala.

A Fertilizer Program for Bolivia

D. A. Russel, R. J. Ballew, J. I. Bucy, and D. A. Waitzman. Jun 70, 114p Bull-Y-9, TA/OST-AN-70-6-7

Descriptors: *Fertilizers, Developing countries, International trade, Wheat, Productivity, Marketing, Potatoes, Rice, Fruit crops, Coffee trees, Oilseed crops, Sugarcane, Benefit cost analysis, Tables(Data), Bolivia.

Bolivia annually imports over \$23 million of agricultural products, including wheat, edible oils, fibers, and dairy products. Wheat is by far the most costly of these imports, and it also seems the most amenable to increased domestic production through the use of new varieties and fertilizers. With lower costs, fertilizer could also be profitably used on such crops as corn, quinoa, rice, cotton, and sugarcane. This document provides a review of the fertilizer program in Bolivia, evaluates its need for fertilizer plants, and analyzes the possibilities for fertilizer marketing. (Author)

PB-211 762 PC A05/MF A01
Agency for International Development, Karachi(Pakistan).

The Feasibility of Harvesting, Processing and Marketing Tuna In Pakistan

Alvin M. Morgan, S. A. Jalil, Masood A. Burney, Douglas M. Jones, and James G. Unti. 1970, 96p TA/OST AN-70-13-3

Prepared in cooperation with Government of Pakistan, Dept. of Fisheries.

Descriptors: *Fisheries, Developing countries, *Pakistan, Fisheries, Tunas, Food processing, Fishing grounds, Coasts, Marketing, Economic development, Canning, Freezing.

The geographical locale of Karachi, with access to known productive tuna fishing areas along with a coastal population of traditional fishermen, are favorable considerations in the development of a deep sea tuna fishing industry for Pakistan. There is an increasing world demand for both frozen and canned tuna, especially in the highly industrialized nations of the world. This market offers the opportunity for Pakistan to earn foreign exchange for such other goods that are required for industrial

expansion and economic development. This report is primarily concerned with two aspects of tuna fishery development: a fishery fleet, and a fish cannery. (Author)

PB-211 774 PC A03/MF A01
Auburn Univ., Ala. International Center for Aquaculture.

Fisheries of Turkey

H. S. Swingle. 20 Jan 72, 28p TA/OST-AN-72-1-3

Descriptors: *Fisheries, Developing countries, *Turkey, Aquaculture, Food, Population(Statistics), Chemical laboratories, Laboratory equipment, Water chemistry, Limnology.

The document briefly reviews the status of the Turkish fisheries program, and provides some recommendations for possible development. The topics covered include: Food and population; water areas and fisheries; government divisions and universities dealing with fisheries; possibility of fisheries in the poppy-growing areas. Also included are a list of equipment and chemicals needed for a basic water chemistry laboratory; a list of equipment needed for a basic limnological research laboratory; and a brief list of references of possible use in identifying fishes of Turkey. (Author)

PB-211 775 PC A04/MF A01
Auburn Univ., Ala. International Center for Aquaculture.

Status of Trout Culture in Peru

E. W. Shell. 15 Aug 71, 54p TA/OST-AN-71-8-1

Descriptors: *Aquaculture, Developing countries, *Peru, *Trout, Fisheries, Evaluation.

The document reports the results, and provides recommendations based on those results, of a survey of trout hatcheries and trout farms in Peru. The purpose is to evaluate the potential for trout farming in Peru and to evaluate certain aspects of the Ministry of Fisheries' proposed program for the development of the trout farming industry. (Author)

PB-211 843 PC A03/MF A01
Kansas State Univ., Manhattan. Food and Feed Grain Inst.

Recommendations for FECOAGROH Grain Storage and Handling Facilities in Honduras

Rept. no. 24

Elwyn S. Holmes. Jul 71, 44p TA/OST-AN-71-7-4

Contract AID/csd-1588

Report on Food Grain Drying, Storage, Handling and Transportation.

Descriptors: *Grains(Food), Food storage, *Food storage, *Honduras, Food processing, Warehouses, Structural design, Materials handling equipment, Drying, Developing countries.

The report provides details concerning the development, design, and evaluation of grain receiving, storage, and handling facilities for the National Federation of Agricultural Cooperatives (FECOAGROH) in Honduras. Detailed descriptions and plan views are given of recommended facilities. An appendix lists U. S. manufacturers and suppliers of equipment referred to in the report. The document may be of interest to those planning grain storage and handling facilities elsewhere.

PB-211 862 PC A12/MF A01
North Carolina Water Resources Research Inst., Raleigh.

Effects of Land Use on Municipal Watersheds

T. E. Maki, and W. L. Hafley. Jul 72, 251p UNC-WRRI-72-71, OWRR B-010-NC(3)

Errata sheet inserted.

Descriptors: *Water quality, *Land use, *North Carolina, Watersheds, *Watersheds, Land use, Regional planning, Surface water runoff, Precipitation(Meteorology), Stream flow, Forest land, Suspended sediments, Roads, Water resources, Water pollution, Rural areas, Agricultural wastes, Waste disposal, Farm land, Hydrology.

Identifiers: *Lake Michie Watershed, Durham County(North Carolina), Orange County(North Carolina), Person County(North Carolina).

A study of the Lake Michie Watershed, the source of water for the municipality of Durham, North Carolina, is reported. The study was concerned with evaluating the effects of land use on water quality, quantity, and timing of flow during the 43-year period since the establishment of the lake. The characteristic composition of the soils and the vegetative cover and their influence on the hydrology of the basin are discussed. Through the interpretation of aerial photographs, Agricultural Census Data and other historic documents, the nature of land use changes within the watershed have been traced. Current status of the watershed is detailed and recommendations presented for improving the quality of the water and the general hydrologic characteristics of the watershed. (Author)

PB-211 882 PC A04/MF A01
Foreign Economic Development Service, Washington, D.C.

A Review of Certain Aspects of the Forestry Program and Organization in Indonesia

Burnett H. Payne, and David S. Nordwall. 23 Apr 71, 62p FEDS-Field-10, TA/OST AN-71-4-1

Descriptors: *Forestry, Indonesia, Developing countries, Forest land, Organizations, Classifications, Protection, Reforestation, Statistical data, Marketing, Productivity.

Indonesia's forest resources represent one of her most valued assets. These resources are not inexhaustable, however, and it is essential to protect them from destructive exploitation. This report provides a review of timber operations in Indonesia, identifies problem areas, and offers a series of recommended solutions. Emphasis is placed on the organization of the Directorate General of Forestry; the use of forest lands, particularly with respect to the granting of timber concessions; the forestry research program; and environmental considerations. (Author)

PB-211 883 PC A05/MF A01
Kansas State Univ., Manhattan. Food and Feed Grain Inst.

Observations and Recommendations for Improving Grain Storage and Marketing in Bolivia

Rept. no. 22

Floyd F. Niernberger, and Harry B. Pfost. May 71, 96p TA/OST-AN-71-5-2

Contract AID/csd-1588

Report on Food Grain Drying, Storage, Handling and Transportation.

Descriptors: *Grains(Food), Food storage, *Food storage, *Bolivia, Marketing, Transportation, Wheat, Rice, Corn, Soybeans, Warehouses, Evaluation, Food sanitation, Developing countries.

The report provides an evaluation of storage and related marketing requirements for the development of the wheat, rice, corn, and soybean industries in Bolivia. Both observations on present conditions and recommendations for future development are given. A 27-page appendix presents detailed guidelines for determining the capacity of various components of a grain storage facility, which should prove generally useful to those interested in this field.

PB-212 001 PC A05/MF A01
General Oceanology, Inc., Cambridge, Mass.

Commercial Feasibility of Fish Protein Concentrate in Developing Countries. Volume II, Part I. Chile, Investment Aspects and General Summary

Final rept.

Gerald D. Bernstein. 26 Jun 70, 78p GO-12-Vol-2-Pt-1, TA/OST-AN-70-6-5

Contract AID/csd-2158

Prepared in cooperation with American Technical Assistance Corp., and Sidney M. Cantor Associates, Inc. See also Volume 1, PB-195 913 and Volume 2, Part 2, PB-212 002.

SELECTED APPROPRIATE TECHNOLOGIES

Descriptors: *Fish protein concentrates, *Chile, *Developing countries, *Food industry, Feasibility, Systems engineering, Marketing, Organizations, Competition, Financing, Proteins, Cost analysis, Investments, Food processing.

The report analyzes the feasibility of commercial production of fish protein concentrate (FPC) in Chile. This first Part consists essentially of summaries and condensations of the significant portions of the study, with enough detail to enable it to stand as an independent document. The topics covered include: The Chilean food system and the potential market for FPC; the isopropyl alcohol process and possible competitors; cost of FPC production; company organization and financing structure for an FPC enterprise in Chile; and alternative protein sources.

PB-212 002 PC A13/MF A01
General Oceanology, Inc., Cambridge, Mass.
Commercial Feasibility of Fish Protein Concentrate In Developing Countries. Volume II, Part II. Chile, Background Information and Supporting Data

Final rept.
Gerald D. Bernstein. 21 Jul 70, 290p GO-12-Vol-2-Pt-2, TA/OST-AN-70-6-6
Contract AID/csd-2158

Prepared in cooperation with American Technical Assistance Corp., and Sidney M. Cantor Associates, Inc. See also Volume 2, Part 1, PB-212 001.

Descriptors: *Fish protein concentrates, *Chile, *Developing countries, *Food industry, Feasibility, Marketing, Food processing, Fishes, Cost analysis, Proteins, Nutrition, Investments, Industrial plants.
Identifiers: Curico Province(Chile), Fortified foods.

The report analyzes the feasibility of commercial production of fish protein concentrate (FPC) in Chile. This second Part of the report provides detailed information from which the discussions and conclusions of Part 1 were drawn. The subjects covered include: The Chilean food situation and market for FPC; proposed specifications and quality characteristics for FPC; selection of process and plant capacity; plant design and construction; process description; raw fish supply; cost of production and investment for a fish protein concentrate plant; modified FAO provisional pattern for protein; relationships among income, food distribution, and per capita calorie and protein intakes in Chile; survey of nutrition and health patterns in Chile; acceptability of fortified foods in the province of Curico.

PB-212 034 PC A08/MF A01
Agency for International Development, Washington, D.C.
Introduction to Record Keeping in a Small Enterprise
R. F. Bruckart. May 68, 154p TA/OST-AN-68-5-3
Prepared in cooperation with the Industrial Development Center, Zaria (Nigeria).

Descriptors: *Records management, *Manuals, *Industrial plants, *Nigeria, Management engineering, Commerce, Developing countries, Supervisors, Statistical data.
Identifiers: Small businesses.

Much experience is available on the fundamental methods employed by managers of small businesses in industrially developing countries who have developed profitable operations. Effective record-keeping, it has been found, is one of the methods. The document introduces basic record-keeping methods similar to those that managers of small industries throughout the world have found useful. The topics covered include: Recording daily transactions; planning and controlling production; records of material or supplies; quality control records; employee records; and how the manager uses records. The document was prepared for use by small-enterprisers in Northern Nigeria, but it should be generally applicable elsewhere.

PB-212 035 PC A06/MF A01
Geological Survey, Washington, D.C.

Hydrology and Water Resources Development In Nepal

Open file rept.
W. W. Everett. Jun 69, 112p TA/OST-AN-69-6-7

Descriptors: *Nepal, *Water resources, Hydrology, Ground water, Economic development, Rivers, River basin development, Developing countries, South Asia.

Water has long been recognized as one of Nepal's most promising resources. Yet, prior to 1960 little had been done to investigate and appraise the resource. By 1969, a nationwide network of hydrological stations had been established, and a groundwater exploration effort had begun. Furthermore, the Department of Hydrology and Meteorology had been established, staffed, and equipped to conduct investigations. The report discusses the history of hydrological investigations in Nepal, and the relation of these investigations to the social and economic problems of water-resources development and management. The general hydrology of the more important river systems of the country is described in detail. (Author)

PB-212 101 PC A04/MF A01
Cornell Univ., Ithaca, N.Y.

Plant Protection Problems In Southeast Asia

Edward H. Glass, Roy J. Smith, Jr, Ivan J. Thomason, and H. David Thurston. 1971, 74p TA/OST AN-71-13-1
Contract AID/csd-3296

Prepared in cooperation with East Asian Pest Management Study Team, and California Univ. Sponsored in part by Agricultural Research Service, Washington, D.C.

Descriptors: *Plants(Botany), Pest control, *Pest control, *Southeast Asia, Insect control, Crop weeds, Plant diseases, Pesticides, Developing countries.

Improved crop protection can do little to reduce the population explosion in East Asia, but it can make important contributions toward assuring an adequate food supply until populations become stabilized through family planning and birth control. This document is the report of a study team which has as its objective the appraisal of the nature and the scope of pest problems affecting food production in the Philippines, Thailand, Malaysia, Taiwan, Hong Kong, Singapore, and Japan. An effort was also made to determine whether the local environment and public health are endangered by improper use and lack of management of pesticides on food and other major crops. Specifically, consideration is given to the status and needs of crop protection in Tropical East Asia; economic and environmental implications of crop protection; possible approaches to solutions of crop protection problems; some international and foreign agencies in plant protection activities in tropical East Asia; and pesticides in public health activities.

PB-212 238 PC A04/MF A01
Agency for International Development, Washington, D.C.

Fisheries

Bibliography Series.
1 Jun 71, 62p Rept no. Agriculture-5

Descriptors: *Fisheries, Bibliographies, *Developing countries, Fisheries, Fish protein concentrates, Marketing, Food processing, Surveys, Research, Economic development, Africa, Asia, Latin America.

The Bibliography is designed to provide information on fisheries programs, projects and research in newly developing countries. It includes a general section on such topics as fish processing, protein concentrates, marketing, research and training as well as regional sections which cover a variety of surveys and reports of many aspects of fisheries activities in individual countries in Africa, Asia and Latin America. Annotations are descriptive of content and include author, title, source of publication and identifying number.

PB-212 265

PC A02/MF A01

New Mexico State Univ., University Park. Water Resources Research Inst.
Fluctuations in Nitrate Concentrations Utilized as an Assessment of Agricultural Contamination to an Aquifer of a Semiarid Climatic Region

Partial technical completion rept.

R. G. Taylor, and P. David Bigbee. Aug 72, 13p WRRI-RR-006, OWRR A-034-NMEX(3)

Descriptors: *Aquifers, Water pollution, *Water pollution, *Nitrates, *Irrigation, Water pollution, Fertilizers, Irrigation, Ground water recharge, Agricultural wastes, Semiarid land, New Mexico, Seasonal variations, Ground water.

Identifiers: Manure, Ogallala aquifer.

Aquifer water has become contaminated in arid and semiarid regions that have been developed for agriculture. Nitrate contamination has been shown to be permeable to the aquifer and harmful to human health. Nitrate concentrations have been used in the study to demonstrate their applicability to examining agriculture practices which contaminate aquifer water. Areas treated with nitrogenous fertilizers and subsequently irrigated were found to contain aquifer fluctuations in nitrate content directly in proportion to irrigation seasons. Agricultural industries with high animal densities per land area, and high water consumption for maintenance, were found to have high, but non-fluctuating, nitrate concentrations. (Author)

PB-212 288

PC A04/MF A01

Agency for International Development, Washington, D.C. Office of Science and Technology.
Appropriate Technologies for International Development. Preliminary Survey of Research Activities

Sept 22, 65p Rept no. TA/OST-72-11

Descriptors: *Economic development, *Developing countries, *Research, Developing countries, Utilization, Corporations, Capital, Design, Systems engineering, Industries.

Identifiers: *Technology, Transfer of technology.

Three papers make up the report. The first paper, 'The Role of the Research Institute in Industrial Growth', is based on observations of industrial research institutes in developing countries. The second paper describes 'Research Interests of Foreign Assistance Agencies Concerning Appropriate Technology'. The third, 'Multinational Corporations and Adaptive Research for Developing Countries', attempts to describe selected types of activities of multinational corporations as illustrative of their involvement and interest in technological development of developing countries. (Author)

PB-212 371

PC A06/MF A01

Agency for International Development, Manila (Philippines).

Housing and Urban Development in the Philippines

Bernard Wagner. Jan 68, 101p TA/OST-AN-68-1-2

Descriptors: *Residential buildings, *Project planning, *Urban development, *Philippines, Developing countries, Reviews, Problem solving, Requirements, Organizations, Management.

Identifiers: Low income groups, Middle income groups.

The document contains a series of papers on housing and urban development problems in the Philippines. Topics included are housing needs and a proposed action program, urban development in Mindanao, reorganization of the home financing commission, modification of the administration of housing and urban programs, the squatter problem, urban planning in the Iligan area, housing of middle and lower income groups, housing investment by insurance companies, and comments on the Draft Administrative Code.

PB-212 372

PC A03/MF A01

Agency for International Development, Washington, D.C.

SELECTED APPROPRIATE TECHNOLOGIES

Leader Training for Aided Self-Help Housing

Jun 69, 40p Rept no. TA/OST-AN-69-6-8

Descriptors: *Residential buildings, Developing countries, *Construction, Manuals, *Leadership, Specialized training, Project planning, Evaluation, Production engineering, Socioeconomic status, Problem solving, Methodology, Recommendations, Reviews.

Identifiers: Self help housing, *Aided self help housing, Low cost housing, *Leader training.

Aided self-help housing is described as a natural way to better homes in the less industrialized areas of the world, can often be reached most effectively through trained local leaders. It is the purpose of this manual to present material useful for conducting a course for such local leaders. The following topics are included: Advantages and disadvantages of this technique for producing homes; examples and case studies demonstrating how aided projects have been carried out by others; various planning principles affecting aided self-help housing; development of skills in construction techniques; material, labor, and financial resources; problems of communicating ideas for low cost housing; and proposals for initiating an aided self-help housing program.

PB-212 382 PC A04/MF A01

Nevada Univ., Reno. Center for Water Resources Research.

Development and Management of Ground Water and Related Environmental Factors in Arid Alluvial and Carbonate Basins in Southern Nevada

Project rept. no. 18

R. L. Bateman, A. L. Mindling, R. L. Naff, and H. M. Joung, Jan 72, 56p OWRR-C-2212(1)

Contract DI-14-31-001-3411

Descriptors: *Ground water, *Management planning, *Semi-arid land, *Nevada, Deserts, Fishes, Conservation, Mathematical models, Alluvium, Carbonate minerals, Agriculture, Information systems.

Identifiers: Cyprinodonts, Desert pupfish, Alluvial basins, *Amargosa Desert, *Nye County(Nevada), Habitat preservation, Management information systems.

Ground-water resources of arid and semi-arid basins in the southwestern United States are generally developed within bounds imposed by physical, legal, and economic constraints. In Ash Meadows, a portion of the Amargosa Desert of southwestern Nevada, ground-water development is subject to the additional constraint of preserving the rare desert pupfish (Cyprinodonts) which inhabit spring pools within the area. Continued withdrawal of ground water for agricultural purposes will eventually decrease water levels to the extent that the natural habitats of the pupfish may be damaged. An unsteady state digital ground-water model is developed to assist in evaluation of these ground-water problems.

PB-212 398 PC A08/MF A01

Humboldt County Dept. of Public Works, Eureka, Calif.

Rural Storage and Collection Container Systems

Interim rept. 1 Jun 70-31 Oct 71.

1972, 155p EPA-SW-41D.I-72

Grant G06-EC-00271

Prepared in cooperation with Garretson-Elmdorf-Zinov-Reibin, Consultants.

Descriptors: *Refuse disposal, *Containers, Storage, Project planning, Rural areas, Collecting methods, Earth fills, Cost analysis, California.

Identifiers: *Solids waste disposal, Humboldt County(California).

The objective of the project was to demonstrate and evaluate two alternative refuse storage and collection container systems for small isolated rural areas, with special emphasis on costs, workability, and community acceptance. The test area for the project is to be the southern one-third of Humboldt County, California, with a population of approximately 10,000 people. In the first system, waste will be deposited in a 40-cu-yd, roll-off con-

tainer that can be picked up and hauled to the central sanitary landfill. In the second system, waste will be deposited in 8-cu-yd containers. These containers will be emptied at the site into a 42-cu-yd collection vehicle that will then proceed to the next container site or, if full, to the landfill. The interim report details the selection of collection equipment (both containers and vehicles) components, and the development of test procedures for evaluating the storage and collection systems.

PB-212 632 PC A17/MF A01

Miner (Thomas H.) and Associates, Inc., Chicago, Ill.

Industrial Development and Feasibility Study, Pulp and Paper Manufacturing in South Vietnam. Book I

Apr 70, 382p TA/OST-AN-70-4-1

Contract AID/VN-54

See also Book 2, PB-212 633.

Descriptors: *Pulp mills, South Vietnam, *Paper industry, *South Vietnam, Feasibility, Developing countries, Market research, Expenses.

Vietnam has a variety of fiber resources which in total constitute an adequate raw material for a pulp and paper industry. The present paper industry was built with only the domestic market in mind, and currently it is entirely dependent on import of pulp. Under these circumstances of small size and imported raw material, the paper industry in Vietnam suffers from high costs. This study examines the feasibility of developing a viable pulp and paper industry in Vietnam in the early post-war period. The scope of the study includes: A review of the existing industry, including facilities, capacities, capabilities, and cost factors; a survey of present and possible future markets, both domestic and in neighboring Southeast Asian countries; a survey of indigenous fibrous raw materials, including types, amounts available, location, and cost; a proposal of location, number, type, and capacity of new facilities; and a calculation of grade costs, net realization, and financial soundness of the proposed facilities.

PB-212 633 PC A14/MF A01

Miner (Thomas H.) and Associates, Inc., Chicago, Ill.

Industrial Development and Feasibility Study, Pulp and Paper Manufacturing in South Vietnam. Book II

Apr 70, 310p TA/OST-AN-70-4-2

Contract AID/VN-54

See also Book 1, PB-212 632.

Descriptors: *Pulp mills, South Vietnam, *Paper industry, *South Vietnam, Feasibility, Developing countries, Market research, Expenses.

The volume is comprised of appendices intended to accompany Book I of this study. The topics covered include: Marketing prospects for export; raw materials for a proposed kraft mill near Dalat; methods, equipment, and estimated costs for bamboo extraction at Phuoc Binh; summary of U. S. Forest Products Laboratory tests; materials, supplies, and unit costs; summary of corporate taxation and exemptions; core making plant; bamboo harvesting report; bagasse report; 250 ton integrated kraft mill.

PB-212 726 PC A05/MF A01

Agency for International Development, Washington, D.C. Office of Science and Technology.

Forestry in Developing Countries. Potentials, Constraints, and Opportunities

Gordon D. Fox, Oct 72, 76p Rept no. TA/OST-72-12

Descriptors: *Forestry, *Developing countries, Forest trees, Economic development, Wood products, Structural timber, Reforestation, Utilization, Transportation, Research, Management.

With about one-half of the world's forest area located in the developing countries, adequate forest programs to manage and exploit this renewable natural resource are an important aspect in economic development. This preliminary analysis focuses on the following issues: principal factors in-

hibiting better management of forest resources; technical aspects of these inhibiting factors; practical steps that might overcome these problems; and likely impact on timber resources and utilization if such steps were taken.

PB-212 748

PC A03/MF A01

Yale Univ., New Haven, Conn. Economic Growth Center.

The Role of the Industrial Sector in Korea's Transition to Economic Maturity

Gustav Ranis, Oct 71, 37p EGC-DP-125, TA/OST AN-71-10-4

Contract AID/csd-2492

Descriptors: *South Korea, *Economic development, *Industries, South Korea, Developing countries, Economic analysis, Unskilled workers, Japan, Taiwan.

Korea belongs to the category of developing country which have small, therefore open, labor surplus dualistic economies, characterized by a relative lack of natural resources and an abundance of unskilled labor at the outset. This paper begins with a definition of the 'ideal' growth pattern for this type of economy. A review is then provided of the actual Korean experience relative to this ideal. Korean performance in this respect is contrasted to two other countries belonging to the same family, i.e. Japan, historically, and Taiwan in the post-war period. Consideration is given to the initial conditions and to the similarities and differences of the transition processes in the countries. Finally, the implications of this analysis with respect to further research and policy are discussed.

PB-212 749

PC A04/MF A01

Harvard Univ., Cambridge, Mass. Center for International Affairs.

Equitable Distribution of Benefits in Integration Schemes Among the Less Developed Countries: The Andean Group

David Morawetz, Apr 72, 67p Economic Development-216, TA/OST AN-72-4-3

Contract AID/cds-1543

Descriptors: *Economic development, Treaties, *Developing countries, *Distribution systems, Commerce, Inequalities, Agreements, Economic analysis, Bolivia, Chile, Colombia, Ecuador, Peru.

Identifiers: *Economic integration, Andean Group customs union.

All economic integration schemes among less developed countries which have been established to date have foundered on the problem of how to equitably distribute the benefits arising from the existence of the scheme. The Cartagena Agreement of the Andean Group customs union (Bolivia, Chile, Colombia, Ecuador, and Peru) includes several measures bearing on this problem. The paper provides a theoretical analysis of the benefit distribution problem, and an evaluation of the benefit distribution provisions of the Cartagena Agreement. Consideration is given to the definition of an 'Equitable' benefit distribution, some problems in measuring net benefits, and the presumptions as to whether benefits are likely to be equally or unequally distributed in integration schemes. A number of schemes which have been proposed and/or adopted to achieve equitable benefit distribution are then examined from a theoretical viewpoint. The measures contained in the Cartagena Agreement are analyzed in the light of this examination, and of the experience of other integration schemes with the benefit distribution problem.

PB-212 779/3

PC A06/MF A01

Nathan (Robert R.), Associates, Inc., Washington, D.C.

An Evaluation of Recent Private Industrial Development in Nicaragua

Jan 71, 109p TA/OST-AN-71-1-1

Contract AID/La-650

Descriptors: *Industrial development, Nicaragua, *Economic development, *Nicaragua, *Foreign aid, *Financing, Developing countries, Industries, Investments, Capital.

Identifiers: Small businesses.

SELECTED APPROPRIATE TECHNOLOGIES

In the mid-1960's, the Agency for International Development decided that the Nicaraguan industrial sector needed access to investment capital to finance a backlog of projects. AID met this need by making \$17 million available to create and strengthen intermediate credit institutions to mobilize capital, both foreign and domestic. This report provides an assessment of the efficacy of the AID programs to the private industrial sector of Nicaragua and suggests changes that might improve them. Specifically, consideration is given to the following: Past rate of growth; prospects for industry in Nicaragua; strategic factors in industrial expansion; shortage for working capital and the debt/equity problems; cost of AID capital; investment climate in the industrial sector; aid contribution to meeting long-term capital needs; strengthening the capacity of the National Development Institute (INFONAC); creation of a new private investment bank; AID loan program as a stimulant to domestic savings; loans to small businesses and artisans; providing technical assistance; performance and impact of the industrial sector in recent years.

PB-212 784/3 PC A16/MF A01
Agency for International Development, Washington, D.C. Office of Program and Policy Coordination.

A Firsthand Study of Industrial Management and Economic Development In India
 Dec 69, 368p TA/OST-AN-69-12-1

Descriptors: *Industrial management, *India, *Economic development, India, Developing countries, Management, Environments, Benefit cost analysis.

Identifiers: Transfer of technology.

The document represents an effort to develop guidelines that can serve as a basis for effective action by managements of individual Indian enterprises in their attempts to adapt to and reduce the impact of negative environmental conditions on their performance. It also seeks to determine the extent to which managerial practices, techniques, concepts, policies, principles, and general know-how which tend to be effective on a relatively widespread scale in U. S. industry can be transferred and/or applied successfully to a developing country such as India. Consideration is given to the costs and benefits involved in the transference process, and to the degree that the Indian environment seriously constrains or prevents such transference. In addition, attention is given to the development of guidelines and meaningful priorities that indicate what action might best be taken by public authorities in dealing with environmental constraints which seriously hinder managerial performance and productive efficiency at industrial enterprises.

PB-212 916/1 PC A20/MF A01
Stanford Research Inst., Menlo Park, Calif.

Costs of Urban Infrastructure for Industry as Related to City Size in Developing Countries. India Case Study

Om Prakash Mathur, Richard Morse, and M. C. K. Swamy, Oct 68, 453p TA/OST-AN-68-10-2
 Contract AID/csd-802

Prepared in cooperation with School of Planning and Architecture, New Delhi, India, and Small Industry Extension Training Institute, Hyderabad, India.

Descriptors: *Urban development, *India, *Industries, *Economic development, Benefit cost analysis, Developing countries, Municipalities, Magnitude, Populations.
 Identifiers: *Industrial development, Urban infrastructure.

The document provides the details of a study which was designed to measure the direct costs of equipping cities of different size for industrial development, including the costs of social infrastructure for new urban industrial employees and their families. It is oriented primarily to the situation in developing economics and is centered on the industrial growth requirements of selected cities in the states of Punjab, Haryana, and Uttar Pradesh, in northern India. An examination is made of the widely held belief that unit costs of incremental infrastructure for new industry tend to be relatively

high in smaller cities, to decrease over some intermediate range of city sizes, and to rise significantly beyond some large city size. Consideration is given to both the effect of city size on costs, and to the combined effect of costs when composition of industry varies with city size.

PB-212 975/8 MF A01
National Academy of Sciences, Washington, D.C. International Marine Science Affairs

Feb 72, 103p
 Library of Congress Catalog Card no. 74-183584.
 International Standard Book no. 0-309-01937-0.
 Paper copy available from the National Academy of Sciences, Printing and Publishing Office, 2101 Constitution Ave., N.W., Washington, D.C. 20418.
 PC\$4.75.

Descriptors: *Oceans, *International relations, Recommendations, Research management, Organizations, Government policies, Developing countries, United States, Oceanography, Fisheries, Information systems, Metrology, Meteorology, International law, Foreign policy.
 Identifiers: United Nations.

The report deals with the heightened stress and political conflict that arise as governmental institutions adapt to new requirements for maintaining order among the variety of ocean uses and users. The purpose of the report is to examine these national and international political institutions in terms of their appropriateness to the goals of wise, effective, and equitable ocean use. Recommendations are also offered to suggest various means to achieve these goals. (Author)

PB-213 181/1 PC A05/MF A01
Puerto Rico Univ., Mayaguez. Water Resources Research Inst.

Determination of the Rate of Biodegradation In Some Polluted Tropical Waters and In Some Types of Liquid Wastes Common in Puerto Rico

Completion rept.
 Luis A. del Valle, Sep 72, 85p OWRR-A-023-PR(1)

Descriptors: *Puerto Rico, Water pollution, *Biochemical oxygen demand, Tropical regions, *Water pollution, Biochemical oxygen demand, Sewage, Biodegradation, Industrial wastes, Reaction kinetics, Temperature, Computer programs.
 Identifiers: Sewage treatment effluent.

The first part of the study evaluates methods for the determination of deoxygenation (biodegradation) rates of polluted waters in Puerto Rico. The experimental part of the study was divided into three phases. The first phase consisted in working with the waste as it came from the particular source to determine its value of K (biodegradation constant) in its original state. The second and third phases of the study consisted in diluting the waste with natural river and sea water to simulate the condition of the waste when discharged into a natural body of water. The degree of dilution does not seem to have any significant effect. On the other hand, when the dilution water is sea water the value of K tends to be higher than when the waste is diluted in fresh water. (Author)

PB-213 372/6 PC-GPO/MF A01-NTIS
Environmental Protection Agency, Rockville, Md. Solid Waste Management Office.

Financing Solid Waste Management In Small Communities
 1972, 16p Rept no. EPA-SW-57ts
 Paper copy also available from GPO \$0.25 as stock no. 5502-0022.

Descriptors: *Waste disposal, *Financing, Urban planning, Communities, Management planning, Local government, Leasing.
 Identifiers: *Bond issues, *Solid waste disposal.

The paper discusses the three major financing techniques (pay-as-you-go, leasing, and long-term borrowing) as they apply to solid waste disposal in small communities. More indirect methods, such as private contracting or grants utilization, are not considered.

PB-213 492/2 PC-GPO/MF A01-NTIS
Environmental Protection Agency, Rockville, Md. Solid Waste Management Office.

An Accounting System for Solid Waste Management In Small Communities
 Enc R. Zausner. 1971, 21p Rept no. EPA-SW-28ts

Library of Congress Catalog Card no. 78-611564.
 Paper copy available from GPO \$0.30 as stock no. 5502-0021, EP3.2:AC2.

Descriptors: *Waste disposal, *Accounting, Cost analysis, Management planning, Benefit cost analysis, Collecting methods, Data acquisition, Information systems, Urban planning, Communities, Forms(Paper).

Identifiers: *Solid waste disposal, Management information systems.

The increasing costs and complexities of solid waste collection and disposal require new, more sophisticated management techniques. Although cost accounting represents only one part of the total information system, its design, installation, and utilization can represent a significant step in the development of effective solid waste management. The proposed system provides a guide to the type and quantity of information to be collected, its classification, and the method of collection. The system described is designed primarily for small communities (<25,000) that collect and dispose of the solid wastes generated in their jurisdiction. The system was specifically designed to be effective for packer-truck collection and landfill disposal operations.

PB-213 594/6 PC A05/MF A01
Texas A and M Univ., College Station.

Development of a Scientific Basis for the Manufacture of Low-Cost Protein Foods and Beverages from Fresh Coconuts

Final rept.
 Karl F. Mattil. 1 Sep 70, 77p* TA/OST-AN-70-9-3
 Contract PIO/T 931-11-190-864, PIO/T-73-3192010

Descriptors: *Nuts(Fruits), *Proteins, *Food processing, Nuts(Fruits), Fruits, Nutritive value, Developing countries.

Identifiers: *Coconuts.

Coconuts represent a potential new indigenous protein source in the coconut producing countries of the world. This report provides the results of an effort to generate fundamental scientific and technological information basic to the practical exploitation of this protein source, and to evaluate the state of the art of processing fresh coconuts for food use. The evaluation is based on both a survey of the literature and personal contacts with those involved with research and development efforts. Results of basic investigations in the following areas are reported: The ultrastructure of coconut meats; physical processing methods for maximum extraction of fat and protein; the amount of heat treatment coconut meat and meal can tolerate without adverse effects on product quality; identification of major classes of protein in coconut meats; characteristics of each class of protein.

PB-213 612/5 PC A17/MF A01
Department of Health, Education and Welfare, Washington, D.C.

A Selected Bibliography on African Foods and Nutrition. Arranged According to Subject Matter and Area

Woot-Tsuen Wu Leung, and Ritva Rauanheimo Butrum, Dec 70, 391p* TA/OST-AN-70-12-5
 Prepared in cooperation with Food and Agriculture Organization of the United Nations, Rome (Italy).

Descriptors: *Food, *Africa, *Developing countries, *Nutrition, *Bibliographies, Food, Human nutrition, Plants(Botany), Diets, Food composition, Food habits, Food industry, Education.
 Identifiers: *African foods.

The bibliography is comprised of references to the world's literature, published in the 1940-1969 time period, dealing with the subject of food and nutrition in Africa. The entries are arranged by country and, within each country, according to general subject (general studies, food resources, food compo-

SELECTED APPROPRIATE TECHNOLOGIES

sition, food supplements, food technology, food habits, nutrition and dietary surveys, nutritional status, and nutrition education). A selected bibliography on African botanical nomenclature is appended.

PB-213 756/5 **PC A10/MF A01**
Kansas State Univ., Manhattan. Food and Feed
Grain Inst.
**Improving the Nutritive Value of Cereal Based
Foods**
Annual progress rept. no. 3, Jan-Dec 70.
Jun 71, 217p TA/OST-AN-71-6-5
Contract AID/csd-1586

Descriptors: *Cereal products, *Nutritive value, *Food processing, Cereal products, *Developing countries, Food processing, Proteins, Soybeans, Peas, Beans, Flours(Food), Bread, Evaluation, Nutrition, Pakistan, Africa.

Identifiers: Food fortification, Organoleptic evaluation.

The document describes the activities and accomplishments of an ongoing project which has as its overall objective the improvement of the nutritional value of cereal-based food in North Africa and Pakistan by supplementation and process modification without decreasing the food acceptability to the general consuming public in those areas. Research effort focused on the use of three protein sources: soy flour, chick-pea flour, and horse bean flour. These were used for food fortification. Emphasis was given to the nutritional and organoleptic evaluations of chapatis, couscous, and Moroccan bread fortified with the high protein flours. (Author)

PB-213 758/3 **PC A06/MF A01**
New York State Agricultural Experiment Station,
Geneva.
**Development of Soy-Based Foods of High Nu-
tritive Value for Use in the Philippines**
W. B. Robinson, M. C. Bourne, and K. H.
Steinkraus. Jan 71, 106p TA/OST-AN-71-1-2
Contract AID/csd-1815

Descriptors: *Soybeans, *Food processing, *Food, Philippines, Nutritive value, Proteins, Flavor, Economic analysis, Developing countries.

Results are given of a research program which was undertaken to develop processes for manufacturing soy-based foods on a scale and of a simplicity appropriate to the socio-economic requirements of relatively small population centers in countries such as the Philippines. Flavor, acceptability, economy, and nutritional value were of primary concern. The report describes research conducted in the following areas: Development of a simple procedure for manufacture of a bland soy beverage and other products that could be easily produced without the use of elaborate and expensive equipment; introduction of the soy beverage to selected groups of Philippine school children; engineering studies on unit operations in soy product manufacturing; nutritional evaluation of the products and the nutritional effects of the unit processes involved; basic laboratory research on physical and chemical qualities of soy products and components to lay a scientific basis for improvement of the products and unit processes involved in their manufacture.

PB-213 764/5 **PC A06/MF A01**
Agency for International Development, Washington, D.C. Office of Nutrition.
**Improving the Nutrient Quality for Cereals.
Report on Workshop on Breeding and Fortifica-
tion. Held at Annapolis, Maryland, 7-9 Decem-
ber 1970**
Jun 71, 107p TA/OST-AN-71-6-6

Descriptors: *Grains(Foods), Developing countries, *Cereal products, Food processing, Meetings, Plant genetics, Quality, Human nutrition. Identifiers: *Food fortification.

There is a great potential for effecting improvement in diet through the breeding of higher protein content and quality in staples and through fortification of such staples during the milling process. The

report presents papers from a Seminar on Breeding and Fortification held at Annapolis, Maryland from December 7-9, 1970. The papers concern progress, problems and potential for the improvement of various crops, including wheat, rice, corn, sorghum and millet. Recommendations are given for future operations and research.

PB-213 766/3 **PC A02/MF A01**
League for International Food Education, Wash-
ington, D.C.
**The Food Industry in Asia, Its Potential for Pro-
viding Low Cost Nutritious Foods. Proceed-
ings of Singapore Workshop, 1-5 November
1971**
Summary rept.
Nov 71, 24p TA/OST-AN-71-11-2

Descriptors: *Food industry, *Asia, *Developing countries, Food industry, Economic development, Human nutrition, Cost factors, Food processing, Meetings.

The Singapore Workshop was convened to provide a forum where Asian private food industry businessmen could discuss the potential of the food industry for providing low cost nutritious foods. This report summarizes the discussions of these businessmen during the week-long meeting. Special emphasis is given to the constraints which were identified as being the ones which hinder the progress of low-cost nutritious foods. Equivalent emphasis is also given to the recommendations for action which the participants felt could help overcome these constraints.

PB-213 787/8 **PC A04/MF A01**
Massachusetts Inst. of Tech., Cambridge. Dept. of
Nutrition and Food Science.
**Extending Protein Concentrates for Child
Feeding by Addition of Inexpensive Simple Ni-
trogen Sources**
Final rept.
Nevin S. Scrimshaw. Oct 71, 63p TA/OST-AN-
71-10-5
Contract AID/csd-1441

Descriptors: *Food additives, Milk, *Nitrogen, Food additives, *Milk, *Proteins, Amino acids, Nutrition, Children.

A series of studies has been undertaken to determine the extent to which the concentration of essential amino acids in dried milk can be extended by the addition of non-specific nitrogen without influencing the nutritional value of the protein. The results of the studies, which were conducted in children and young men, are summarized in this report. The non-specific nitrogen source used was a mixture of glycine and diammonium citrate. The results support the conclusion that at any time that it is necessary to extend the 'protein' content of milk supplies for the supplementary feeding of population groups, inexpensive non-specific nitrogen sources may be used to an extent of at least 10% without impairing the ability of the milk to meet any normal protein needs.

PB-213 794/9 **PC A14/MF A01**
Kasetsart Univ., Bangkok (Thailand). Inst. of Food
Research and Product Development.
**Report on Protein Food Development Project,
1969-1971**
Amara Bhumiratana, and Amorn Nondasuta.
1971, 302p TA/OST-AN-71-13-2
Prepared in cooperation with the Health Dept.,
Bangkok (Thailand). Nutrition Div. Text in English and Thai.

Descriptors: *Proteins, *Food processing, Nutrition, Children, Diets, Developing countries, Thailand.

The document reports the activities and accomplishments of a project which was instituted to improve the nutritional conditions in Thailand. The principal objectives were: To promote development in food technology and related fields; to develop high-protein food supplements for infants and preschool children; to test new products for suitability and acceptability by consumers; and to promote new products on a commercial scale in an

effort to increase consumption among the people. The information provided includes: The results of field trials of protein food prototypes; chemical and biological assays; flowcharts for the production of various protein foods; protein food promotion efforts; protein-enriched menus for school children, including recipes for their preparation.

PB-214 172/9 **PC A14/MF A01**
Arizona Univ., Tucson. Inst. of Arid Lands Re-
search.
**Salinity Problems in Arid Lands Irrigation: A
Literature Review and Selected Bibliography**
Information paper no. 1
Hugh E. Casey. 1972, 311p* WRSIC-73-300
Grant DI-14-01-0001-1616

Descriptors: *Bibliographies, Irrigation, *Arid lands, Irrigation, *Irrigation, Salinity, Water quality, Land reclamation, Drainage, Watersheds, Leaching, Water rights, Soil moisture, Droughts, Salt water, Greenhouses, Reviews, Irrigated land.
Identifiers: Colorado River Basin.

A bibliography of 986 references with accompanying text that reviews broadly such topics as water quality and the total drainage basin, salinity prevention and soil reclamation, salinity and drought effects on plants, soil and water salts, basic water balance problems in relation to irrigation, plus a perspective on historic salinity problems and an overview. Socioeconomic aspects are considered, with reference to the Colorado River basin as an example in microcosm. There is discussion of currently used and potential ameliorative techniques that would render current methods more efficient, raise productivity enough to constitute a breakthrough, and high-humidity low water-use greenhouse structures that would radically alter current arid lands irrigation methods. (Author)

PB-214 489/7 **PC A05/MF A01**
International Society for Rehabilitation of the Dis-
abled, New York.
**Closing the Communications Gap. The Role
and Functions of Information Media in Reha-
bilitation Services**
Final rept.
Charles Kalisky. 1971, 99p SRS-RD-2297
Grant SRS-RD-2297

Descriptors: *Rehabilitation, *Information systems, *Periodicals, Effectiveness, Communications management, Handicapped workers, Project planning, Organizations, Improvement, International relations, Reviews, Manpower utilization, Services, Developing countries, Methodology, Bibliographies.
Identifiers: Disabled persons.

The final report of the International Rehabilitation Program Development Project determines ways and means of improving information services for those working with the handicapped all over the world. Specifically, the project has demonstrated the value of a periodical published in the major languages to disseminate news and significant developments in the field. A number of novel services were initiated, including a series of papers and reports on advanced techniques and methods designed to assist workers in developing countries; a bibliography of available material on rehabilitation in several languages; an international library of films and slides to aid in training personnel; a multilingual glossary of rehabilitation terms; and a Research Referral Service to act as a clearinghouse for current information. (Author)

PB-214 508/4 **PC A03/MF A01**
Illinois State Water Survey, Urbana.
Nonpoint Rural Sources of Water Pollution
Shundar Lin. 1972, 40p* Rept no. ISWS-73-CIR1111

Prepared in cooperation with Illinois State Dept. of Registration and Education.

Descriptors: *Surface water runoff, Water pollution, *Water pollution, *Rural areas, *Nutrients, Water pollution, *Agricultural wastes, Water pollution, Reviews, Fertilizers, Nitrogen, Phosphorus, Illinois, Soil erosion, Sources, Livestock, Industrial waste treatment, Pesticides, Subsurface drainage.

SELECTED APPROPRIATE TECHNOLOGIES

Identifiers: Feedlot wastes, Manure, Water pollution control.

A literature survey was made to gather information for defining the quantity and characteristics of non-point water pollution sources from rural areas. Major constituents of such pollution include fertilizers, pesticides, erosion and sediment, and animal wastes. Studies showed that nitrogen and phosphorus from surface runoff and subsurface drainage are often greater in concentration than that from sewage effluents. Pesticides are only slightly soluble in water, and about 5 percent of that applied may enter waterways through surface runoff and erosion. With the exception of sediment transport, farm animal wastes can be the most serious sources of pollution from farm lands. Control techniques are discussed.

PB-214 862/5 **PC A03/MF A01**
 Agency for International Development, Washington, D.C. Office of Science and Technology.
RANN (Research Applied to National Needs) Program: Potential Benefits to Developing Countries
 Jan 73, 48p Rept no. TA/OST-73-16

Descriptors: *Developing countries, *Transfer of technology, Impact, Project planning, Benefit cost analysis, Resources, Information systems, Disasters, Energy, Urban planning, Environmental engineering, Water pollution, Sociometrics, Community development, Services.
Identifiers: *Spinoffs, Technological development, RANN program.

RANN stands for Research Applied to National Needs -- an expanding program of the National Science Foundation designed to stimulate the harnessing of science in the service of man. This report identified 48 individual RANN projects that could have special relevance to the needs of developing countries. It clarifies their technical significance to these countries and illustrates possible types of spin-off benefits. No attempt is made to identify how a specific research project might benefit a particular developing country. Rather, the attempt here is to indicate in a general way the nature of the potential benefit to developing economies within the context of technology transfer.

PB-214 984 **PC A03/MF A01**
 Public Health Service, Washington, D.C.
Refuse Collection and Disposal for the Small Community.
 William A. Xanten, and Ralph J. Van Derwerker. Nov 53, 46p
 Prepared in cooperation with the American Public Works Association, Chicago, Ill.

Descriptors: *Communities, Waste disposal, *Waste disposal, Planning.
Identifiers: *Solid waste disposal, EPAL.

Surveys have shown that many small communities do not follow sanitary refuse practices. There are many reasons why these communities have not taken steps to protect the health and welfare of their citizens. Predominant among the basic causes, however, is the belief that adequate service is too expensive, and a lack of information on how to establish and operate a satisfactory system. It has been clearly demonstrated many times, that urban fly control and rodent control must be based upon adequate storage, collection, and disposal of community wastes. A practical refuse control program is within the means of any community. This publication proposes to describe certain factors which needs to be considered in establishing sanitary refuse practices, and to present representative operational and cost data in such manner that they may be interpreted to meet local conditions.

PB-215 103 **PC A02/MF A01**
 Field Information Agency, Technical.
Materials, Techniques, and Testing Methods for the Sanitation (Bacterial Decontamination) of Small-Scale Water Supplies in the Field Used in Germany During and after the War.
 Final rept.

Alexander Goetz. 8 Dec 47, 10p Rept no. FIAT-1313

Descriptors: *Sewage treatment, *Military operations.
Identifiers: EPAL.

The report presents results obtained from investigations of the nature and methods for water purification used in Germany during and following the second world war.

PB-215 149/6 **PC A04/MF A01**
 Agency for International Development, Washington, D.C.

Techniques for Assessing Hydrological Potentials in Developing Countries (State of the Art and Research Priorities)
 Jan 73, 74p TA/OST-73-17
 See also PB-207 192.

Descriptors: *Water resources, Developing countries, *Hydrology, Research, Stream flow, Soil erosion, Ground water, Sediment transport, Remote sensing, Probes, Soil water.

The report describes current capabilities and future needs for assessing hydrological potentials under the following topical headings: stream flow, erosion and sediment transport, water movement in unsaturated soils, ground water, precipitation, evaporation, and hydrologic applications of remote sensing. Established techniques and methodologies are described under 'State of the Art', while the most interesting emerging areas for attention by developing countries and foreign assistance agencies are presented under sub-topics entitled 'Current Research' and 'Research Opportunities for Application in Developing Countries.' The report is based in part on a preliminary analysis prepared by the U.S. Geological Survey, 'Techniques for Assessing Water Resource Potentials in the Developing Countries,' Open File Report, December 1971. (Author)

PB-215 282/5 **PC A02/MF A01**
 Environmental Protection Agency, Cincinnati, Ohio. Solid Waste Management Office.

Residential Solid Waste Generated in Low-Income Areas
 Samuel Hale, Jr. 1972, 17p Rept no. EPA-SW-83TS

Descriptors: *Waste disposal, *Socioeconomic status, *Urban areas, Waste disposal, Distribution(Property), Characteristics, Trends, Residential buildings.

Identifiers: *Economically depressed areas, Disadvantaged groups, Low income groups, *Poverty areas, *Solid waste disposal.

Variations inherent in the generation of solid wastes make it extremely difficult to predict quantities that can be expected from a dwelling within a residential neighborhood. Some possibly influencing factors are climate, season, socioeconomic level, and dweller density. The objective of the study was to examine the quantities and critical factors involved in the generation of solid wastes in low-income residential neighborhoods. The results are presented in order that a better understanding of waste quantities and characteristics may be obtained. (Author)

PB-217 117/1 **PC A06/MF A01**
 National Academy of Science, Washington, D.C.

Regional Workshop on Water Resources, Environment, and National Development. Volume I. Summary of Proceedings. Singapore, March 13-17, 1972
 Mar 72, 120p
 Contract AID/csd-2584

Prepared in cooperation with the Science Council of Singapore.

Descriptors: *Water pollution, Southeast Asia, *Developing countries, Water resources, *Southeast Asia, Water resources, Meetings, Water quality, Sewage treatment, Industrial wastes, Water supply, Population growth, Singapore, Pesticides, Regional planning.

Identifiers: Oil pollution, Eutrophication, Solid waste disposal, *Water pollution abatement, AID.

The report contains the summary of proceedings of a workshop organised under the joint sponsorship of the Science Council of Singapore and the National Academy of Sciences of the U.S.A. Its main purpose was to focus attention on current problems of water resources and the environment faced by countries of the Southeast Asian region, and stimulate regional cooperation in seeking solutions.

PB-217 119/7 **PC A12/MF A01**
 National Academy of Sciences, Washington, D.C. *Conservación del Medio Ambiente Físico y el Desarrollo (Environment and Development)*

Jul 71, 254p
 Contract AID/csd-2584

Text in Spanish. Summary in English. Primer Seminario Centroamericano Sobre el Medio Ambiente Físico y el Desarrollo, Antigua, Guatemala, 25-30 Jul 71. See also report dated Jul 71, PB-211 487.

Descriptors: *Economic development, *Central America, *Environment, *Developing countries, Meetings, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Agriculture, Industries, Forestry, Services, Regional planning, Education, Pesticides, Water resources.
Identifiers: AID.

In developing regions like Central America there are appearing signs, sometimes alarming, of environmental contamination and degradation of natural resources. The first Central American Workshop on Development and the Environment examines in depth the regional environmental problems, and provides the planning directors and governmental officials with the necessary criteria for incorporating environmental aspects into their development programmes. The focus of the Workshop was on the industrial, agricultural, and service industry sectors. Included in the report are background papers and the recommendations of the Workshop.

PB-217 142 **PC A04/MF A01**
 Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.

Engineering Studies of Coffee Mill Wastes in El Salvador, C. A., October 18-November 9, 1960.
 Hayse H. Black. Apr 61, 57p
 Report to International Cooperation Administration, United States of America Operations Mission to El Salvador.

Descriptors: *El Salvador, *Water pollution, *Food processing, *Industrial waste treatment.
Identifiers: *Coffee processing, *Water pollution control, EPAL.

The report pertains to control and treatment of both solid and liquid wastes from processing coffee in El Salvador. Included are: Notes on conferences and observations pertaining to wastes from processing coffee in El Salvador during the period October 18 to November 9, 1960; Review of technical literature dealing with control and treatment of liquid wastes resulting from the processing of coffee; and Future research on coffee wastes.

PB-217 293/0 **PC A05/MF A01**
 National Academy of Sciences, Washington, D.C. *A Report on the LIPI-NAS Workshop on Natural Resources. Volume I. Overall Findings and Recommendations-Working Group Reports*

1972, 81p
 Contract AID/csd-2584

Prepared for Workshop on Natural Resources, held in Jakarta (Indonesia) 11-16 Sep 72. Prepared in cooperation with Indonesian Institute of Science (Lembaga Ilmu Pengetahuan Indonesia), Jakarta.

Descriptors: *Economic development, Natural resources, *Natural resources, *Indonesia, Developing countries, Land, Soils, Forestry, Water resources, Oceans, Mineral deposits, Policies, Recommendations, Meetings.
Identifiers: AID.

SELECTED APPROPRIATE TECHNOLOGIES

The purpose of the Workshop was to formulate recommendations on how to utilize the natural resources of Indonesia in a manner consistent with the needs and rising expectations of a growing population. Specific objectives were: (1) to suggest policies and procedures for strengthening the integrated planning and utilization of natural resources; (2) to suggest scientific and technological inputs; and (3) to provide a form for a coordinated and constructive exchange of views by key scientists, policy-makers, and administrators. Part I of the Report considers problems and major recommendations. Sectoral recommendations are given in Part II. (Author)

PB-217 382 **PC A04/MF A01**
 Federal Water Pollution Control Administration,
 Chicago, Ill. Great Lakes Region.
Water Quality Investigations, Lake Michigan Basin. Population and Economy.

Technical rept.
 Aug 67, 58p

Descriptors: *Lake Michigan Basin, *Economic Development, Demography.
 Identifiers: EPAL.

This is one in a series of reports documenting background information for the development of a water quality control program for Lake Michigan and its drainage basin. For planning purposes the Lake Michigan Watershed has been subdivided into appropriate tributary drainage basins. For the purpose of projecting water uses and waterborne waste loads for these subbasins and in order to develop relationships among water uses, waste loads, population and economic development, information has been gathered on present conditions and past trends concerning population and economy. (Author)

PB-217 569 **PC A03/MF A01**
 Federal Water Pollution Control Administration,
 Charlottesville, Va. Middle Atlantic Region.
Water Supply and Water Quality Control Study Tar River Basin North Carolina.

Dec 67, 49p

Descriptors: *Tar River Basin, *Economic development, *North Carolina, Economic development, River basin development, Forecasting.
 Identifiers: EPAL.

The objectives of the study were to determine the economic growth and to evaluate the need for and value of storage for water supply and quality control for the Tar River Basin. The study area consists of the entire Tar drainage basin, which includes all or parts of eleven counties of North Carolina. The period of study covers the present and the 50-year period commencing in 1975, and extending to 2025. The needs for water supply and quality control storage were determined for the years of 1980, 2000, and 2025.

PB-217 667 **PC A09/MF A01**
 Harvard Univ., Cambridge, Mass. Div. of Engineering and Applied Physics.
Operations Research In Water Quality Management.

Final rept.
 Harold A. Thomas, Jr. and Robert P. Burden. 15 Feb 63, 179p
 Contract PH-86-62-140

Descriptors: *River basin development, *Mathematical models, *Water resources, *Operations research, Stream flow, Sewage treatment, Economic development.
 Identifiers: EPAL.

New methods are reported for evaluating the composite effects of combinations of streamflow regulation, waste water treatment, and waste water regulation for application in comprehensive programs to improve and maintain the quality for water in major water resources systems. The objective is to show how these methods may be used to strengthen the rational base for river basin planning by use of mathematical systems analysis.

PB-217 790 **PC A02/MF A01**
 Robert A. Taft Sanitary Engineering Center, Cincinnati, Ohio.
Treatment of Wastes from Coffee Processing In Costa Rica.

Herbert R. Pahren, and Rudolfo F. Saenz. 1960, 19p Rept no. SEC-TR-W60-2

Descriptors: *Food processing, *Industrial waste treatment, Costa Rica.
 Identifiers: *Water pollution control, *Coffee processing, EPAL.

To determine the feasibility of the treatment of these wastes in stabilization ponds in the country of Costa Rica, a preliminary study was made to learn more about the characteristics of the coffee wastes. Tentative calculations were then made concerning the size of stabilization ponds necessary for these wastes. A brief outline of the information collected is summarized.

PB-218 226 **PC A05/MF A01**
 Public Health Service, Washington, D. C. Div. of Sanitary Engineering Services.
Manual of Septic-Tank Practice. Developed In Cooperation with the Joint Committee on Rural Sanitation.

1 Aug 59, 96p Rept no. PHS-Pub-526
 Addendum to part I inserted.

Descriptors: *Septic tanks, *Manuals.
 Identifiers: EPAL.

The Manual on septic tank practices has been prepared for use as a guide by health agencies, building officials, installers, and others, to meet the need for an authoritative treatise on the subject.

PB-218 232/7 **PC A06/MF A01**
 Foreign Economic Development Service, Washington, D.C.
Planning Korea's Agricultural Development. Analyses and Recommendations for the Third Five Year Plan

William R. Gasser, James P. Cavin, Richard S. Mapley, Edward S. Micka, and Troy Mullins. Aug 70, 110p FEDS-Field-5, TA/OST-AN-70-8-2

Descriptors: *Agricultural economics, *South Korea, Economic development, Livestock, Grains(Food), Marketing, Income, Planning, Demand(Economics), South Korea.
 Identifiers: AID.

The population of the Republic of Korea is expected to exceed 35 million by 1976, a gain of about 13% over the 1969 figure. In the same period, the Gross National Product in real terms is projected to increase more than 80%, with income per capita showing a gain of about 78%. This population and income growth will generate a rapid rise in the demand for food, requiring an expansion of 25% to 30% in the total supply of farm products. This report contains a series of recommendations concerning steps that may be taken to effect this expansion in the areas of agricultural production and marketing. Consideration is given to the general improvement of long-range projections, livestock improvement plans, problems relating to grains, evaluation of marketing needs, and proposed reorganization for economic research. (Author)

PB-218 338/2 **PC A03/MF A01**
 Transport and Road Research Lab., Crowthorne (England).

A Deflection Survey Technique for Pavement Evaluation In Developing Countries

H. R. Smith. 1973, 40p Rept no. TRLR-LR-525

Descriptors: *Flexible pavements, Deflection, *Highways, Developing countries, Tropical regions, Design, Surveys, Evaluation, Covering, Test methods, Malaysia, Zambia, Great Britain.
 Identifiers: GBRRL.

The role of deflection beam surveys in the evaluation of flexible pavements is discussed. Deflection studies in Malaysia and Zambia are described from which a suitable survey method for use on tropical roads, for the purpose of designing strengthening overlays or pavement reconstruction, has been de-

veloped. Testing at 100m intervals in both wheel-tracks is recommended with provision for a higher density of testing if the road deflection is variable, if the road surface has areas of visible distress, or if there are occasional very high deflection values. Deflection values of roads tend to exhibit skewed distributions but it is concluded that this is not necessarily a significant factor from the point of view of survey analysis for practical overlay design. (Author)

PB-218 681/5 **PC A04/MF A01**
 Texas A and M Univ., College Station. Water Resources Inst.

An Investigation of Hydrological Aspects of Water Harvesting

Research project completion rept. 1 Jul 69-31 Aug 72
 Otto Wilke, Jack Runkles, and Charles Wendt. Sep 72, 65p TR-46, OWRR-B-071-TEX(2)
 Contract DI-14-31-0001-3132

Descriptors: *Catch basins, Surface water runoff, *Water supply, Arid land, Playas, Lakes, Erosion control, Crude oil, Precipitation(Meteorology), Slopes, Cost estimates, Economic analysis, Simulation, Mathematical models, Texas.
 Identifiers: Lubbock(Texas), Amarillo(Texas), Texas High Plains, OWRR.

Water harvesting is a potential source of water for arid and semi-arid lands. The objectives were to determine combinations of land surface treatments and land forming which result in efficient but inexpensive water harvesting catchments and to determine the optimum shape of catchments. In laboratory studies with inexpensive materials, crude oils exhibited the best sealing properties. However, by six months after application, 750 gal per ac of crude oil has no apparent effect on runoff from field plots. Water harvesting catchments constructed by grading the soil to form V-shaped valleys and then compacting the surface yielded runoff equal to 31 to 43 percent of all precipitation. After rains, sand blown from such catchments may damage tender downwind vegetation. Some water erosion occurred, but, after two years, the basic shape and the performance of the catchments had not been damaged by erosion. Chemical weed control is recommended. (Author Modified Abstract)

PB-218 990/0 **PC A04/MF A01**
 Denver Regional Council of Governments, Colo.
Recycling Activity Description: Transfer, Intermediate Storage, Processing, Recycling

Final rept.
 May 72, 56p Rept no. DRCOG-72-013
 Contract HUD-H-1392
 Prepared in cooperation with Urban Drainage and Flood Control District, Denver, Colo.

Descriptors: *Waste disposal, Colorado, *Regional planning, Waste disposal, Materials recovery, Storage, Trends, Forecasting, Management planning.

Identifiers: Waste transfer stations, Waste recycling, *Solid waste disposal, *Denver(Colorado), Reuse project, UPCD.

The report includes a description of the four functions relating most directly to solid waste recycling, reuse, or resource recovery, including transfer, intermediate storage, processing, and recycling. The Denver, Colorado area was used for the study. The present situation is also summarized, and long-range trends for each function are forecast. Recent and current citizens group and industry activity in recycling programs is described. As a basis for improving the existing situation as described, a number of technical and management concepts are presented in relation to their current and future feasibility, possible date of availability, or the form of management action required to implement them. (Author Modified Abstract)

PB-219 684 **PC A02/MF A01**
 Ohio State Univ., Columbus. Dept. of Agricultural Economics and Rural Sociology.

SELECTED APPROPRIATE TECHNOLOGIES

Is Inexpensive Credit a Bargain for Small Farmers: The Recent Brazil Experience. (Br-332.71-A211a).

Occasional paper

Dale W. Adams, Harlan Davis, and Lee Bettis. Jan 72, 16p Occasional Paper-58, AID-BR-332.71-A211a
Contract AID/csd-2501
Report on 'Studies in Agricultural Capital and Technology.'

Descriptors: *Agricultural economics, *Developing countries, *Credit, *Economic analysis, Brazil, Banking business, Policies, Problem solving, Recommendations.

Identifiers: *Small farmers, AIDH.

The authors discuss major credit distribution problems on the supply side of credit in Brazil as they affect the problem of extending credit to small farmers. They suggest that adjustments in current policies might substantially increase the flow of credit to small farmers through regular banking channels. Information from Brazil is used to illustrate the contention. The following topics are considered: background on agricultural credit in Brazil; interest rate policy; institutional agricultural credit; results from credit and interest rate policies; reasons for loan concentrations; conclusions; and policy recommendations. (Author Modified Abstract)

PC-219 685 PC A03/MF A01
Ohio State Univ., Columbus, Dept. of Agricultural Economics and Rural Sociology.

An Analysis of Shifting Relative Prices and Marketing Facility Investments in the Context of Technological Change in the Developing Countries. (338.13-J65).

Occasional paper

S. S. Johl. Oct 71, 27p Occasional Paper-37, Aid-338.13-J65
Contract AID/csd-2501
Report on 'Studies in Agricultural Capital and Technology'.

Descriptors: *Agriculture, *Developing countries, *Marketing, *Economic analysis, India, Prices, Production rate, Growth, Grains(Food), Regulations, Incentives, International trade.
Identifiers: Imports, AIDH.

The author states that agricultural production growth of most of the developing countries in the last 3-4 years has very considerably decreased their dependence on imports, especially food grains. This shift from heavy dependence on imports to fast-increasing internal surpluses has created the need for new government regulations governing the control and operation of markets so that the domestic market becomes fully responsive to the production changes and at the same time keeps up the incentives for higher and better production. (Author)

PC-219 696 PC A02/MF A01
Ohio State Univ., Columbus, Dept. of Agricultural Economics and Rural Sociology.

Changes In Small Farmer Credit Use In Southern Brazil, 1965-69. (Br-332.71-A211).

Occasional paper, Jun 69-Feb 72
Dale W. Adams, and Joseph L. Tommy. 11 Feb 72, 10p Occasional Paper-61, AID-BR-332.71-A211
Contract AID/csd-2501

Descriptors: *Agricultural economics, *Brazil, *Credit, Surveys, Banking business, Policies, Statistical data, Economic analysis, Classifications.
Identifiers: *Small farmers, *Nonbank credit, AIDH.

The paper summarizes the results of a study in southern Brazil which was focused at determining the characteristics of farmers who received additional bank credit during the period 1965 to 1969. Information is also presented on changes in use of non-bank credit among farmers over the same period. Data were drawn from two sample surveys covering farm operation in 1965 and 1969 for 289 farms in southern Brazil. All of the units had 124 acres or less. Principle economic activities on the farms included various mixed enterprises of corn, beans, rice, wheat, hogs and dairy. Inducing banks

to loan in a more socially efficient manner appears to be a major challenge. (Author Modified Abstract)

PC-219 708 PC A03/MF A01
Kansas State Univ., Manhattan. Food and Feed Grain Inst.

Tour of Some U. S. Grain Storage Facilities for Entente Fund Officials. (Afr-631.23-C559).

Trip rept. no. 30, 11 May-16 May 72
Do Sup Chung. May 72, 27p AID-AFR-631.23-C559
Contract AID/csd-1588
Report on Food Grain Drying Storage. Handling and Transportation.

Descriptors: *Grains(Food), *Storage, *Buildings, Evaluation, Surveys, Facilities, Kansas, Developing countries, West Africa, Problem solving, Silos. Identifiers: AIDH.

A four day tour of grain storage facilities for Entente Fund officials was conducted by Kansas State University. Fundamental principles concerning condensation and problems related to condensation in metal storage buildings were discussed. The following aspects were considered to be important in reducing the possibility of condensation in metal storage facilities for bagged grains: (1) adequate ventilation (2) white paint used to paint the exterior, (3) do not stack grain bags against the walls, and (4) cover the grain pile with a plastic sheet, or put insulation on the roof inside of the storage building, thus creating at least a twenty-degree F. temperature differential between the interior and exterior air. (Author Modified Abstract)

PC-219 710 PC A02/MF A01
Cornell Univ., Ithaca, N.Y. Dept. of Agricultural Economics.

Preliminary Observations on the Production of New High Yielding Rice Varieties and Traditional Rice Varieties in Suphan Buri, Thailand. (Th-633.18-B974).

Rept. for Dec 70-Feb 72
William R. Burton, and Tongruay Chungs. Feb 72, 16p Occasional Paper-52, AID-TH-633.18-B974
Contract AID/csd-2805
Presented at Kasetsart University, Bangkok, Thailand. Feb 1-4, 1972.

Descriptors: *Rice plants, Farms, *Farm management, Thailand, Production capacity, Selection, Cost factors, Rural areas.
Identifiers: AIDH.

The research paper discusses field research in Thailand on certain economic aspects of new rice technology, particularly the new high yielding rice varieties and associated inputs. The actual location of the study area was in Suphan Buri Province, some 100 kilometers northwest of Bangkok, Thailand. A total of 153 rural households in six villages cooperated in the study. Forty of the rice farms were located in a deep water, broadcasted area where floating rice varieties are grown. The remaining 93 rice-farms were in a transplanted rice area where many farmers were growing the new high yielding rice varieties. The authors provide summary tables on the following topics: table of farms; planted area and varieties grown; farmers growing new varieties; area and variety planted for the 1970 and 1971 seasons. They include summary discussions of high yielding varieties other new rice technology, research and costs of production. (Author Modified Abstract)

PC-219 711 PC A02/MF A01
Utah State Univ., Logan. Dept. of Agricultural and Irrigation Engineering.

Economic Aspects of Irrigation from Ground Water. (Br-631.7-H279a).

George H. Hargreaves. 1972, 23p AID-BR-631.7-H279a
Contract AID/csd-2167

Presented at National Ground Water Symposium, Sao Carlos, Sao Paulo, Brazil, 27 Nov-1 Dec 72.

Descriptors: *Irrigation, *Agricultural economics, *Ground water, Irrigation, *Brazil, Irrigation, Design, Cost estimates, Drainage, Arid land, Farm

crops, Soybean plants, Wheat plants, Forage crops, Cotton plants.
Identifiers: AIDH.

Typical examples of economic analysis of ground water development in Brazil are discussed, citing specific data for Bolivian conditions with conversion to Cruzeiro values, but without a detailed knowledge of commodity prices and costs in Brazil. Use of ground water can produce both irrigation and drainage benefits -- pumping from underground reservoirs has alleviated many drainage problems. Typical irrigation systems were selected, designs developed, and costs estimated. From theoretical considerations, and from available crop, moisture - yield relationships developed in other areas, the supply of adequate moisture properly distributed throughout the growing season should at least double production for cotton, sugar cane, soy beans, wheat, forage crops, and others with similar water requirements. Irrigation costs are analyzed. (Author Modified Abstract)

PC-219 712 PC A15/MF A01
Georgia Univ., Athens.

A Literature Review and Research Recommendations on Cassava 'Manihot Esculenta Crantz'. (016.66423-H495).

Research rept. Jul 69-Mar 72
C. H. Hendershott. Mar 72, 341p AID-016.66423-H495
Contract AID/csd-2497

Descriptors: *Farm crops, Agronomy, *Food, Developing countries, Food supply, Production, Ecology, Botany, Genetics, Soils, Cultivation, Plant diseases, Nutritive value, Biochemistry, Economics, Market research.

Identifiers: *Cassava, AIDH.

In the fall of 1969, a team of scientists from the University of Georgia was commissioned by the Technical Assistance Bureau of the Agency for International Development to (1) compile on a systematic basis the available information about cassava and related research now in progress; (2) synthesize, appraise, and analyze the information gathered and to determine as near as possible the broad limitations and potential of cassava as a food and feed crop; and (3) to prepare a list of research needs in their order of importance, for the orientation of future research on cassava. This team, consisting of ten men, represented the areas of Agronomy, Animal Nutrition, Botany, Economics, Food Science, Genetics, Horticulture, Human Nutrition and Plant Pathology. Each of their reports appear as a separate chapter in this manuscript and in each case represents their own view on cassava in their particular area of speciality. (Author)

PC-219 721 PC A02/MF A01
Kansas State Univ., Manhattan. Food and Feed Grain Inst.

Development of a Simple Storage Unit and Storage Method Applicable for Humid Areas in Developing Countries. (631.23-C559).

Progress rept. no. 31
Do Sup Chung. 30 Jun 72, 24p AID-631.23-C559
Contract AID/csd-1588
Report on Food Grain Drying, Storage, Handling and Transportation.

Descriptors: *Grains(Food), *Storage, *Environmental tests, *Humidity, Developing countries, Environment simulation, Corn, Containers, Desiccants, Silica gel, Test chambers, Observation, Fungus deterioration, Time, Effectiveness, Adsorbents.
Identifiers: *Humid regions, AIDH.

The development of a simple, inexpensive grain storage unit and storage method which can be used at farm and local levels in humid areas in order to preserve the quality of grain is discussed. Losses result from inadequate facilities and improper handling of food grains. Efforts are devoted to the development of storage that would not require electricity, and that could be easily maintained and operated by unskilled labor. Materials, methods, time and partial results are discussed. The grain used in this preliminary report was corn. A silica-gel adsorbant appears feasible, but

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cheaper drying agents are needed. (Author modified abstract)

PB-219 725 PC A03/MF A01
Ohio State Univ., Columbus. Dept. of Agricultural Economics and Rural Sociology.

Methodology and General Data Description: Farm Level Capital Formation In Sao Paulo, Brazil. (Br-338.1-W515).

Occasional paper, Jun 69-Dec 71.

Kelso L. Wessel, and William C. Nelson. Dec 71, 44p Occasional Paper-47, AID-BR-338.1-W515

Contract AID/csd-2501

Descriptors: *Agricultural economics, *Capital, *Farm management, *Brazil, Surveys, Economic analysis, Production, Productivity, Statistical data, Prices, Classifications, Income, Consumption, Savings, Investments, Financing.

Identifiers: San Paulo(Brazil), Government credit programs, Land tenure, Technical assistance, AIDH.

The focus of the research paper is on the capital formation process on Brazilian farms, with special emphasis on the role of credit and technology in bringing about rapid changes in agricultural production and/or productivity. An agricultural survey was made of 383 farms in the state of Sao Paulo, Brazil, in 1970 in order to obtain the necessary farm level data. Several homogenous groups were identified which reflected farm characteristics of size, type, technology, tenure, market orientation, management level and mechanization. Analyses were made of farm organization, income, consumption, savings, investment and other distinguishing characteristics to show the production-income-growth process for each group. (Author Modified Abstract)

PB-219 735 PC A02/MF A01
National Fertilizer Development Center, Muscle Shoals, Ala.

Potential Fertilizers for Developing Countries. (631.8-T297a).

Summary rept. Jul 68-Jul 72.

Aug 72, 20p AID-631.8-T297a

Contract PASA-TA(QA)-6-69

Descriptors: *Fertilizers, Developing countries, Evaluation, Ureas, Phosphate inorganic acids, Phosphate deposits, Sulfates, Tropical regions.

Identifiers: AIDH.

The report presents a brief summary of tests recently made or in progress for production of several potential fertilizer materials that may have application in developing countries. Such materials include urea-phosphate rock, urea-single superphosphate based materials, urea-ammonium sulfate, granulated rock phosphate and improved urea. Emphasis is placed on the use of urea since it is now and will continue to be the most important nitrogen source in developing countries. Tests thus far are promising for development of a coating material which will improve the physical characteristics of urea used under tropical conditions. (Author Modified Abstract)

PB-219 744 PC A07/MF A01
Yale Univ., New Haven, Conn. Economic Growth Center.

The Relevance and Prospects of Small Scale Industry In Colombia. (Co-338.64-B534).

Discussion paper

Albert Berry. 25 Apr 72, 139p EGC-DP-142, AID-CO-338.64-B534

Contract AID/csd-2492

Descriptors: *Industrial relations, *Colombia, *Productivity, *Scale(Ratio), Plants(Industries), Magnitude, Economic surveys, Statistical analysis, Development, Efficiency, Labor relations, Policies, Predictions.

Identifiers: *Small businesses, Technological development, AIDH.

There is a shortage of documented information on Colombia's small scale industry. An approach utilized here focuses on, (1) the historical development (with emphasis on the last 20 years) of small scale production, (2) management performance in

terms of the actual and potential efficiency with which converts resources into output, (3) the growth tendencies of plants and firms over a period of time according to their sizes, (4) the relative factor productivity compared to larger industry, and (5) possible strategies for the success of this form of production. The data indicate that small and medium plants are on somewhat higher output/capital ratios than larger ones. (Author Modified Abstract)

PB-219 757 PC A04/MF A01
Michigan State Univ., East Lansing. Dept. of Agricultural Economics.

Economic Analysis of Agricultural Production and Labour Utilization among the Hausa in the North of Nigeria. (Afr-338.1-N842).

African rural employment study Apr 66-Mar 67 D. W. Norman. Jan 73, 53p AREP-4, AID-AFR-338.1-N842

Grant AID/csd-3625

See also reported on Sep 72, PB-219 730.

Descriptors: *Agriculture, *Nigeria, *Farm management, Surveys, Communities, Rural areas, Data acquisition, Classifications, Land use, Manpower, Seasonal variations, Financing, Income, Statistical data, Linear programming, Farm crops. Identifiers: Zaria(Nigeria), AIDH.

A case study examines the farming practices and production of Moslem farmers in the Zaria area of Northern Nigeria. Three Moslem villages were selected; Hanwa, which borders on Zaria itself, Doka, and Dan Mahawayi. The results of the study were derived from 42 farming families in Dan Mahawayi and 62 families in the other 2 villages. Data were secured on land and labor; seasonality of farming and off-farm occupations; farm capital goods and cash expenses; acres, yields and location of food and cash crops; composition of farm and family income; and comparative statistics for large and small farms in the three villages. (Author modified abstract)

PB-219 759 PC A02/MF A01
Cornell Univ., Ithaca, N.Y. Dept. of Agronomy.

Relationships among Physical and Chemical Properties of Representative Soils of the Tropics from Puerto Rico. (Rq-631.42-P555).

Agronomy paper for Jun 69-Mar 73

Warren R. Philipson, and Matthew Drosdoff. Mar 72, 6p Agronomy Paper-893, AID-RQ-631.42-P555

Contract AID/csd-2490

Pub. in Soil Science Society of America Proceedings, v36 n5 p815-819, Sep-Oct 1972.

Descriptors: *Soil properties, Tropical regions, *Puerto Rico, Soil properties, Soil surveys, Soil horizons, Regression analysis, Soil chemistry, Soil profiles, Soil water, Cation exchanging, Tables(Data). Identifiers: AIDH.

In an investigation of the extent to which predictive soil property relationships can be relied upon in characterizing soils of the tropics classified at the reconnaissance level, 9 to 15 soil properties, of 370 horizons, from 84 Puerto Rican profiles, were studied by correlation and multiple linear regression. The soils represented six orders of the new U.S. Soil Taxonomy (7th Approximation); Vertisols, Mollisols, Alfisols, Inceptisols, Ultisols, and Oxisols. Multiple regression equations were formed from the data of each order, with 15-bar moisture content, CEC, organic carbon, extractable iron, and base saturation as dependent variables. The results indicate that, although it is possible to eliminate certain properties from tropical soil data acquisition and still adequately characterize the soil, the specific properties that can be successfully eliminated depend on the soil order. (Author)

PB-219 768 PC A03/MF A01
Ohio State Univ., Columbus. Dept. of Agricultural Economics and Rural Sociology.

Technological Change and the Traditional Small Farmer of Rio Grande Do Sul, Brazil. (Br-631-R225).

Occasional paper

Norman Rask. Jun 72, 37p Occasional Paper-85, AID-BR-631.R225
Contract AID/csd-2501
Report on 'Studies in Agricultural Capital and Technology.'

Descriptors: *Agricultural economics, *Brazil, *Economic development, Statistical data, Management methods, Land use, Farm crops, Livestock, Manpower, Demographic surveys, Education, Income, Communities.

Identifiers: *Technological change, *Small farmers, Rio Grande do Sul(Brazil), Lajeado(Brazil), AIDH.

The paper concerns research on the determination and evaluation of capital formation and the relationship of this process to technological change and economic development for the small farmer of Rio Grande Do Sul in Brazil. The author provides a general background of the geographic region and settlement patterns and a general description of small farm agriculture as it is practiced in this Brazilian state. The study reports on rates of technological change on farms as related to farm size, technology available, and institutional settings. Findings are related to those for large farms. A case study of more than 6500 small farms located in the municipio of Lajeado is presented. (Author Modified Abstract)

PB-219 772 PC A03/MF A01
Yale Univ., New Haven, Conn. Economic Growth Center.

Rural-Urban Migration, Urban Unemployment and Underemployment, and Job Research Activity in Ldc's. (331.127-F461).

Discussion paper

Gary S. Fields. Dec 72, 29p EGC-DP-168, AID-331.127-F461

Contract AID/csd-2492

Descriptors: *Unemployment, *Developing countries, Urban areas, Mathematical models, Population migrations, Rural areas.

Identifiers: Underemployment, AIDH.

A formal theoretical model is presented, with which the equilibrium allocation of the labor force between labor markets is analyzed. Following the model of Harris and Todaro, the focus is on the voluntary movement of workers between labor markets as the equilibrating force, instead of the more conventional mechanism of wage adjustment. Four additional factors are considered: a more generalized account of the process of search for urban jobs; favoring of educated workers over uneducated workers by employers in hiring; the possibility of unemployment in the so-called 'murky sector'; and recognition of labor turnover in a multi-period framework. Results are compared with predictions by Harris and Todaro. Urban unemployment rates were found to be considerably lower than predicted by the Harris-Todaro model. The theory of quantity adjustment being the equilibrating mechanism in labor markets is considered. Results presented demonstrate that the resulting framework gives predictions that are closer to actual experience than the Harris-Todaro model.

PB-219 774 PC A07/MF A01
North Carolina Univ., Chapel Hill. Dept. of Environmental Sciences and Engineering.

Planning Small Water Supplies In Developing Countries. (628.72-L384).

Final rept. Jul 69-Jul 72

Donald T. Lauria. 1972, 141p AID-628.72-L384

Contract AID/csd-2494

Descriptors: *Water supply, Developing countries, Water resources, Community development, Management, Economic models, Benefit cost analysis, Demand(Economics), Supply(Economics), Construction, Central America.

Identifiers: AID.

The research included two principal objectives: (1) develop a theoretical planning model for deciding water supply timing and scale in small communities of developing countries; (2) initiate field studies to obtain data on the parameters of the model to make it operational. The work of model development had to focus on several communities instead

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of only one. Additionally, time in the model had to be made discrete because budgets are imposed at fixed points in time. Finally, the model had to include the considerations of Manne's model pertinent to developing countries: economies of scale, water supply benefits, increasing demand, the discount rate, etc. While the first research objective is theoretical, the second is primarily applied. It was proposed to obtain at least preliminary information on water demand patterns in small communities, costs of water system construction, the economics of scale of water systems abroad, and by imputing, the benefits of publicly supplied water. All of the field data were obtained from Central America. (Author)

PB-219 777 PC A03/MF A01
Harvard Univ., Cambridge, Mass. Center for International Affairs.
A Subjective Equilibrium Theory of Share Tenancy. (333.53-W286).
Economic rept., 31 May 67-Oct 72
Peter Warr. Oct 72, 31p Economic Development-222, AID-333.53-W286
Contract AID/csd-1543

Descriptors: *Agricultural economics, *Developing countries, *Land use, *Economic analysis, Reviews, Economic development, Production, Uncertainty principle, Allocations, Policies, Labor relations.
Identifiers: Sharecropping, Tenancy, Resource allocation, Land reform, AIDH.

An economic development report reviews the analytics of share tenancy for land reform and other aspects of agricultural policy in the developing nations. Section 1 discusses the comparative statics of resource allocation under share-cropping, fixed rent tenancy, and capitalist production using wage labor. The implications of production uncertainty are treated in section 2 and are related to the conclusions of the previous section. Production uncertainty is shown to modify the comparative static conclusions on resource allocation and to provide an explanation for the existence of share-cropping despite its alleged inefficiency. (Author)

PB-219 950/3 PC A02/MF A01
Washington State Univ., Pullman.
Waste Treatment for Small Flows
J. F. Kreissl. 1971, 25p
Presented at the Annual Meeting American Society of Agricultural Engineers, Washington State Univ., Pullman, Wash., 27-30 June 1971.

Descriptors: *Sewage treatment, *Rural areas, Cost estimates, Water pollution, Septic tanks, Aerobic processes, Sanitary sewers, Force mains, Sewage disposal.
Identifiers: EPASW.

The report surveys the problems of waste treatment in rural areas. It describes various treatment alternatives and gives cost estimates.

PB-219 980/0 PC A03/MF A01
Alaska Univ., College. Inst. of Water Resources.
Sludge Production and Disposal for Small, Cold Climate Bio-Treatment Plants
Completion rept.
Timothy Tilsworth. Dec 72, 50p IWR-32, OWRR-A-033-ALAS(2)
Contract DI-14-31-0001-3202, DI-14-31-0001-3502

Descriptors: *Sludge drying, *Freezing, *Sewage treatment, Sludge disposal, *Dewatering, *Sludge disposal, Design criteria, Sand filtration, Aeration, Activated sludge process, Cost estimates, Water pollution.
Identifiers: *Sludge treatment, OWRR.

A sludge disposal process consisting of modified sand drying beds in combination with the freeze-thaw technique utilizing natural refrigeration was evaluated. The purpose of freeze-thawing of sewage sludge is principally to condition the sludge such that it is readily dewaterable and, subsequently, results in a reduced volume of solids to be further processed. The study consisted of three separate evaluations using three model drying

beds for each respective run. Two of the beds were studied at sludge depths of six inches, and the third bed was evaluated at an eighteen-inch sludge depth. Settled activated sludge for placement on the model beds was obtained from the sedimentation tank of a local activated sludge plant.

PB-220 349/5 PC A18/MF A01
Office of Water Resources Research, Washington, D.C. Water Resources Scientific Information Center.
Irrigation Efficiency, A Bibliography
Apr 73, 423p WRSIC-73-214, W73-09115

Descriptors: *Irrigation, Bibliographies, *Sprinkler irrigation, Efficiency, Abstracts, Policies, Management, Water supply, Design, Arid land, Farm crops, Evapotranspiration, Salinity, Soil water, Water conservation, Utilization, Water consumption, Indexed(Documentation).
Identifiers: OWRR.

The report, containing 272 abstracts, is another in a series of planned bibliographies in water resources to be produced from the information base comprising SELECTED WATER RESOURCES ABSTRACTS (SWRA). At the time of search for this bibliography, the data base had 53,230 abstracts covering SWRA through February 15, 1973 (Volume 6, Number 4). Author and subject indexes are included. (Author)

PB-220 352/9 PC A04/MF A01
Nevada Univ., Reno. Center for Water Resources Research.
Simulation Theory Applied to Water Resources Management. Phase III. Development of Optimal Operating Rules
Hydrology and water resources technical rept.
J. W. Fordham. Jan 72, 51p H-W-Pub-13,
OWRR-C-2153(3372)(2)
Contract DI-14-31-0001-3372
See also report dated Sep 69, PB-197 849.

Descriptors: *Water resources, *Management, *Rivers, *Economic models, Computerized simulation, Management planning, Evaluation, Optimization, Algorithms, Reservoirs, Arid land, Time, Regression analysis, Allocations, Hydrology, California, Nevada, Systems analysis.
Identifiers: Two river systems, Truckee River, Carson River, OWRR.

The project evaluates simulation as a planning and management tool for water resources, evaluated in the context of the Truckee and Carson River System in Nevada and California. A simulation model of the two-river system was constructed which was verified using historical flows and management practices. This simulation model was then embodied in an optimization algorithm for the system as a whole. The problem was formulated as a capacitated flow network and solved using an out-of-kilter algorithm. The reservoir releases and diversions from several flow traces were then subjected to multiple regression analysis to determine optimal operating rules for the five reservoirs and for diversions within the system. (Author Modified Abstract)

PB-220 525/0 PC A03/MF A01
Abt Associates, Inc., Cambridge, Mass.
A Study of Rural Cooperatives: Summary Volume
Final rept. 1 Jul 71-28 Feb 73
William L. Hamilton. Feb 73, 37p OEO-LN-1368
Contract OEO-BIC-5296
Paper copy also available from NTIS \$4.75/set of 2 reports as PB-220 524-SET.

Descriptors: *Rural areas, Marketing, *Economic development, Rural areas, Commerce, Reviews, Benefit cost analysis, Classifications, Socioeconomic status, Requirements, Objectives, Recommendations, Policies.
Identifiers: *Rural cooperatives, OEO.

An analysis is presented of rural cooperatives as a program to provide economic and non-economic benefits to low-income members and the rural community. (Author)

PB-220 526/8 PC A13/MF A01
Abt Associates, Inc., Cambridge, Mass.
A Study of Rural Cooperatives: Analysis
Final rept. 1 Jul 71-28 Feb 73
William L. Hamilton. Feb 73, 279p OEO-LN-1369
Contract OEO-BIC-5296
Paper copy also available from NTIS \$4.75/set of 2 reports as PB-220 524-SET.

Descriptors: *Rural areas, *Marketing, *Economic development, Rural areas, Commerce, Benefit cost analysis, Socioeconomic status, Community development, Policies, Data acquisition, Management.
Identifiers: *Rural cooperatives, OEO.

The study is designed to answer questions dealing with developing and structuring programs of support to cooperatives. These questions involve the goals coops set, and how they are articulated, the different strategies a low-income coop may follow, and those which work best in various situations, the effectiveness of the low-income coops in accomplishing the goals they select, the internal and external factors related to success in delivering benefits, and the type and level of support low-income cooperatives need.

PB-220 825/4 PC A06/MF A01
National Academy of Sciences, Washington, D.C.
Ferrocement: Applications In Developing Countries
Panel study.
Feb 73, 105p
Contract AID/csd-2584
Summaries in French and Spanish. Library of Congress Catalog Card No. 73-4027.

Descriptors: *Reinforced concrete, *Developing countries, *Wire cloth, Reinforced concrete, Boats, Food industry, Equipment, Roofing, Evaluation, China, Silos, Construction materials, Thailand, Ethiopia, New Zealand.
Identifiers: *Ferrocement, NASNAE.

An ad hoc panel was convened to concentrate on three specific tasks: (1) evaluating the current state of the art of ferrocement as an engineering material; (2) evaluating the principal areas of application on both land and water; and (3) developing specific recommendations for promoting the use of ferrocement in a logical, effective manner. Specific areas covered in the report include: ferrocement for boatbuilding; for food-storage facilities; for food-processing equipment; for low-cost roofing; and materials technology. Appendices discuss Ferrocement boatbuilding in a Chinese commune; Ferrocement food storage in Thailand; Ferrocement-lined underground grain silos in Ethiopia; and New Zealand ferrocement tanks and utility buildings.

PB-221 096/1 PC A06/MF A01
Louisiana State Univ., Baton Rouge. Dept. of Chemical Engineering.
Single Cell Proteins from Cellulosic Wastes
Final rept.
C. D. Callahan, and C. E. Dunlap. 1973, 105p*
EPA-6702-73-02
Grant PHS-EC-00328

Descriptors: *Solid waste disposal, Cellulose, *Cellulose, *Fermentation, *Agricultural wastes, *Food processing, *Bagasse, Solid waste disposal, Proteins, Biodeterioration, Drying, Process variables, Cost estimates, Pilot plants, Utilization, Sugarcane.
Identifiers: *Food supplements, *High protein supplements, Hyperfiltration, NERC.

The need for protein feed and the need to dispose of waste cellulose are problems being studied to develop a feasible method for the direct conversion of cellulosic wastes to microbial protein-a single cell protein to be used as an animal feed supplement. This report presents data on the process and summarizes research in large-scale production. The economics and techniques of the conversion process are compared with work done by petroleum companies on the fermentation of hydrocarbons. Controlling variables used in the process are defined and significant goals necessary to achieve success in the field are described.

SELECTED APPROPRIATE TECHNOLOGIES

The research deals mainly with the alkali treatment and fermentation parts of the process. Different micro-organisms from which single cell protein can be produced are given. Research in the areas of cell flocculation, flotation, or hyperfiltration are recommended to improve the most costly single step of the process-drying the cells. Methods of decreasing the degree of crystallinity are also included. The practicality of complete acid hydrolysis of cellulose to a soluble substrate for conversion to yeast protein and partial acid hydrolysis of the cellulose followed by microbial consumption is discussed. An economic analysis is given of the potential markets and the competitive cost with other proteins. (Modified author abstract)

PB-221 142/3 PC A07/MF A01
Carnegie-Mellon Univ., Pittsburgh, Pa. Dept. of Mechanical Engineering.
Special Topics. Human Powered Transit; Remote Medical System; Water Treatment
Final rept.
John C. Purcupile. May 73, 130p*
Contract HUD-H-1558
See also PB-215 071.

Descriptors: *Bicycles, Research, *Medical services, Trailers, *Potable water, Water treatment, *Urban planning, Research, Design, Roads, Central city, Medical equipment, Osmosis, Urban areas, Rural areas.
Identifiers: OUTR.

The report includes final results of project presented in the December 17, 1971 publication, *The New City*, which addresses the useful application of technology to solving urban problems. Topics include: (1) Human Powered Transit - examines elements of a human powered system: human power output, vehicle design, roadway design, and potential areas for the system such as a CBD, campus, and planned community; (2) Remote Medical System - develops a conceptual design of a system using mobile vans, paramedics and telecommunication to provide health services in geographically remote or in inner city areas and includes a bibliography; (3) Water Treatment System - designs and builds an inexpensive water treatment system using the principle of reverse osmosis to provide safe drinking water in rural areas. This system will be introduced by Peace Corps and Vista workers in appropriate areas.

PB-221 494/8 PC-GPO/MF A01-NTIS
Caldwell Lace Leather Co., Auburn, Ky.
Secondary Waste Treatment for a Small Diversified Tannery
Environmental protection technology series
E. L. Thackston. Apr 73, 82 EPA-R2-72-209
Grant FWPCA-WPRD-25-01
Paper copy available GPO \$1.25 as EP1.23/2:73-209.

Descriptors: *Industrial waste treatment, *Tanning materials, *Water pollution, Tanning materials, Activated sludge treatment, Leather, Design, Performance evaluation.
Identifiers: *Tanneries, *Water pollution control, Biological industrial waste treatment, ORM.

The Caldwell Lace Leather Co. of Auburn, Kentucky, a small tannery using primarily alum tanning but some chrome and vegetable tanning, received a demonstration grant to investigate and demonstrate methods of treating tannery wastes for discharge to a small stream. A research contract with Vanderbilt University produced findings which have previously been reported and are reviewed herein. A modified completely-mixed activated sludge plant was constructed, along with facilities to handle specific problem wastes. After it had been operating for a year, an EPA survey team conducted a study which showed that the plant was performing as predicted by the research phase, except for solids carryover from the secondary clarifier due to mechanical problems. After the problems were corrected, the plant began producing an effluent which more than met expectations, removing 97% of the suspended solids and 95% of the BOD. The report reviews the characteristics of the wastes and discusses the treatment process.

PB-222 331/1 PC A02/MF A01
Hawaii State Dept. of Planning and Economic Development, Honolulu, State Center for Science Policy and Technology Assessment.
A Solid Waste Primer. Facts and Statistics on Solid Waste Handling Disposal
Ginger Plasch. 28 Jan 72, 11p
Grant NSF-GT-25
Presented at Solid Waste Recycling Conference, Honolulu, Hawaii, 27-28 Jan 72.

Descriptors: *Solid waste disposal, *Hawaii, Materials handling Cost estimates, Legislation, Waste disposal.
Identifiers: NSF.

This short primer provides (a) a description of methods of handling and disposing of solid waste materials, (b) solid waste information and statistics concerning Oahu, (c) capsule information on Hawaii State legislation, and (d) some definitions of types of solid waste and methods of disposal. (Author)

PB-222 495/4 PC A03/MF A01
Colorado State Univ., Fort Collins. Environmental Resources Center.
Institutional Requirements for Optimal Water Quality Management in Arid Urban Areas
Completion rept.
Wynn R. Walker, Gaylord V. Skogerboe, Robert C. Ward, and Thomas L. Huntzinger. Jun 73, 47p
Completion-48, OWRR-B-071-COLO(4)
Contract DI-14-31-0001-3567

Descriptors: *Water supply, Optimization, *Water quality, Optimization, *Urbanization, Water quality, Water pollution, Semiarid land, Mathematical models, Utah Lake drainage area, Requirements, Regional planning, Summarizing, Government policies, Systems analysis.
Identifiers: *Denver(Colorado), OWRR.

Water management strategies in arid urbanizing regions require careful evaluation of alternatives for supplying future demands and controlling water quality. Mathematical models were developed which describe the interrelationships among various institutional factors in order to delineate the requirements for implementing optimal policies. The first of two study areas selected to test the utility of the models is Denver, Colorado. The Utah Lake drainage area in central Utah is the second region considered. In this region, water quality management is necessary to insure the continued use of water in the downstream population center of the state. Together these models produce results useful in determining the optimal strategies for water management in arid urbanizing areas. A generalized summary is presented to integrate these findings into a West-wide evaluation of this problem. (Modified author abstract)

PB-222 511/8 PC-GPO/MF A01-NTIS
National Area Development Inst. of Spindletop Research, Inc., Lexington, Ky.
Improving Water Quality Management Planning in Nonmetropolitan Areas
Final 25 Apr-25 Aug 72
E. Evan Brunson, John D. Leslie, and Edwin W. Webber. Jan 73, 69p* EPA-68-01-0194
Contract EPA-68-01-0194
Paper copy available from GPO \$0.95 as EP1.2:W29/7.

Descriptors: *Regional planning, *Water quality, *Rural areas, Water quality, *Water pollution, Regional planning, Assessments, Local government, Management planning, State government, Communities, National government, Financing.
Identifiers: Intergovernmental, OAP.

The report presents the results of a study which examined water quality management planning in nonmetropolitan areas. It presents recommended improvements reflecting both national policy and the diverse problems of these areas. The objective of the study was to assist EPA in adapting its requirements more closely to nonmetropolitan problems and to prescribe appropriate roles for other Federal and state agencies and substate planning and development organizations in the process. Three States - Oregon, Wisconsin and South Caro-

lina - were selected, each containing several non-metropolitan substate districts, and representing different intergovernmental approaches to water quality management planning and a significant amount of program activity by the four Federal agencies involved. They also presented sufficient commonality to provide valid general conclusions.

PB-222 773/4 PC A14/MF A01
Utah State Univ., Logan. Dept. of Agricultural and Irrigation Engineering.
Irrigation Management for Control of Quality of Irrigation Return Flow
Environmental Protection Technology series
Larry G. King, and R. John Hanks. Jun 73, 321p
EPA-R2-73-265
Paper copy available from GPO \$3.45 as stock no. EP1.23/2:73-265.

Descriptors: *Irrigation, Subsurface drainage, *Subsurface drainage, Mathematical models, Hydrology, Salinity, Soil water, Evapotranspiration, Management planning, Leaching, Flow rate, Computer programs, Arid regions.
Identifiers: *Return flow.

The models described in the report were developed to aid in the control of irrigation return flow. Field studies tested the possibilities for using the unsaturated soil profile including the crop root zone as a temporary salt reservoir and providing excess water for leaching and salt discharge when desired. Two models were developed for describing flow of water and salt through the soil with extraction of water by evapotranspiration. One model was designed for use as an irrigation management tool while the other model was initially intended to provide a detailed understanding of the water and salt flow through the soil. Timing of irrigation was tested as a management variable.

PB-223 373/2 PC A07/MF A01
Mississippi State Univ., State College. Water Resources Research Inst.
A Study of Managerial Practices in Rural Water Systems
Charles P. Cartee, and D. C. Williams, Jr. Jul 73, 133p* OWRR-B-008-MISS(1)

Descriptors: *Water supply, *Management methods, *Rural areas, *Water services, Systems engineering, Standards, Growth, Requirements, Surveys, Inequalities, Operations, Maintenance, Operators(Personnel), Management analysis, Mississippi.
Identifiers: OWRR.

The rural community water system program in Mississippi has grown until the systems total is now over 580, the second largest of all the states. Due to the rapid growth and changing demands and standards, a study of managerial practices was deemed appropriate. The emphasis is directed toward deficiencies in management. Also of concern were the relations of operating and maintenance costs per user to system size.

PB-223 510/9 PC A06/MF A01
North Central Forest Experiment Station, St. Paul, Minn.
Black Walnut as a Crop. Black Walnut Symposium, Carbondale, Illinois, August 14-15, 1973
Forest service general technical rept. (Final)
Jul 73, 120p* Rept no. FSGTR-NC-4

Descriptors: *Nut trees, Research, *Walnuts, Cultivation, Walnut wood, Plant genetics, Plant growth, Economic development, Marketing, Wood products, Plant reproduction, Protection, Meetings.
Identifiers: *Juglans nigra, Silviculture, FS.

The report contains 30 papers on black walnut presented at a symposium in Carbondale, Illinois, in August 1973. Subjects covered include black walnut resources, utilization, and marketing; silviculture; tree improvement; nut culture and production; protection; and economics.

PB-224 222 PC A05/MF A01
Cornell Univ., Ithaca, N.Y. Dept. of Agricultural Economics.

SELECTED APPROPRIATE TECHNOLOGIES

Capital Formation of the Ecuadorian Frontier: A Study of Human Investment and Modernization In the Riobambenos Cooperative
 Peter M. Gladhart. Apr 72, 78p A.E.Res-72-5,
 AID-EC-3338.1-G542
 Contract AID/csd-2823
 Identifiers: AIDH.

The agricultural production activities of spontaneous settlers is described in detail, with special focus upon the determinants of family income and investment and rate of capital formation. The cooperative Riobambenos del Rio Chilimpe was selected for extensive study. Production processes and family income structure was analyzed for 22 farmers for calendar year 1967. The most important sources of income for the majority of farmers were, in order: crop sales, livestock sales, and timber sales. 59% of family receipts for the average farmer were provided by crop sales. The most important crop was plantain. Important developmental benefits of land settlement in Santo Domingo de Los Colorados include: economic integration, redistribution of income, and creation of a modern agricultural sector.

PB-224 266/7 PC A06/MF A01
 Environmental Protection Agency, Cincinnati, Ohio. Office of Water Program Operations.
Selection and Operation of Small Wastewater Treatment Facilities - Training Manual
 Charles E. Sponagle. Apr 73, 117p* Rept no. EPA-430/1-73-005

Descriptors: *Sewage treatment, *Manuals, Education, Packaged sewage treatment, Septic tanks, Industrial plants, Water pollution, Maintenance. Identifiers: *Sewage treatment plants, Physical chemical treatment, EPAWP.

The training manual consists of a series of outlines used as a base of instruction. Subjects covered include characteristics of the water environment; pollution from municipal and industrial sources; methods of wastewater treatment; consideration of specific types of small treatment plants, including septic tanks, package plants, and lagoons; and control tests, sampling, and inspections associated with maintaining effective treatment plant operation.

PB-224 411/9 PC A02/MF A01
 Puerto Rico Planning Board, Santurce.
Experimental Industrialized Housing Program. Model H-620 - Single Family Dwelling
 Final rept, on phase 2.
 30 Sep 72, 19p Rept no. PRPB-71-02
 Prepared by Puerto Rico Urban Renewal and Housing Administration.

Descriptors: *Residential buildings, Reinforced concrete, *Prefabrication, Houses, *Construction, *Puerto Rico, Socioeconomic status, Cost analysis, Asbestos cement products, Roofs, Wooden structures, Floors, Walls, Project planning. Identifiers: *Low cost housing, Detached dwellings, Low income housing, UPCD.

The report contains a description and plans for a reinforced concrete house with asbestos cement roof, to be prefabricated by industrialized methods. A detailed cost analysis is included.

PB-224 749/2 PC A05/MF A01
 National Academy of Sciences, Washington, D.C.
Mosquito Control. Some Perspectives for Developing Countries
 Mar 73, 76p*
 Contract AID/csd-2584

A report of an Ad Hoc Panel of the Advisory Committee on Technological Innovation, Office of the Foreign Secretary. Summaries in Spanish and French.

Descriptors: *Culicidae, *Pest control, *Developing countries, *Insect control, Nematoda, Fungi, Larvae, Parasitology, Plants(Botany), Growth regulators, Fishes, Protozoa, Insect vectors, Invertebrates. Identifiers: *Mosquito control, *Biological insect control, AID.

The panel of Perspectives in Mosquito-Control Methods Suitable for Developing Countries met in Washington, D.C. four times during 1972 and 1973. The panel identified almost fifty topics in biological, chemical, or environmental control of mosquitoes that are not receiving the research attention they warrant. The panel chose nine topics that were promising for use in developing countries. These topics are: larvivorous fish, invertebrate predators, genetic control, parasitic nematodes, parasitic protozoans, parasitic fungi, pathogenic bacteria, juvenile hormone mimics, and larvicidal plants. Each topic covered in the report includes a list of selected readings, and source of research. Panel members are listed.

PB-225 129/6 PC A03/MF A01
 National Academy of Sciences, Washington, D.C.
Research Management and Technical Entrepreneurship: A U.S. Role In Improving Skills In Developing Countries
 An Hoc Advisory Panel.
 1973, 50p
 Contract AID/csd-2584
 Library of Congress Catalog Card No. 73-12294.

Descriptors: *Industrial engineering, *Developing countries, *Transfer of technology, *Management planning, Research management, Research, Reviews, Quality control, Production control, Improvement, Economic forecasting, Management training, Industrial relations, Problem solving, Project planning, United States. Identifiers: Less developed countries, Research and development, AID.

The Ad Hoc Advisory Panel on Research Management and Technical Entrepreneurship in LDCs reviewed the gamut of technical functions involved in improving industrial operations in LDCs. It examined research management as a part of technical management—from quality and production control, through product and process improvement, to the development of indigenous technology or assimilation of advanced technology from abroad, and finally to project or process evaluation. The report argues for an experimental approach to try out and perfect avenues of training, in concert with other countries similarly engaged, and to the fullest extent possible within the developing countries themselves.

PB-225 511/5 PC A04/MF A01
 Nevada Univ., Reno. Center for Water Resources Research.
Arid Urban Water Management: Some Economic, Institution and Physical Aspects
 Hydrology and water resources technical rept.
 G. F. Cochran, and W. C. Wilson. Nov 71, 72p H-W-Pub-11, OWRR-1872(3173)(1)
 See also PB-204 492.

Descriptors: *Water resources, *Systems analysis, *Water supply, *Nevada, *Arid land, Water supply, Organizations, Lake Mead, Groundwater, Land use, Water distribution, Management analysis, Surface waters, Rates(Costs), Urban areas, Economic factors. Identifiers: Las Vegas(Nevada), OWRR.

The study area is the Las Vegas Valley in southern Nevada which has a ground- and surface-water supply system. Possible future population growth and water requirements for the area are examined. Water use projections are based on type of use and area of use predicted on land use plans and economic relationships. Area water pricing schemes are examined to disclose possible inequities in burden carried by various user groups to amortize water facilities and pay operating costs. The pricing mechanism is examined as a means of controlling water usage and providing equitable cost distribution. Water related institutions extent are examined in light of their apparent ability to exercise optimal or near optimal control over the water resources systems. An alternative institution is proposed which would enhance control and optimal use of available resources. Models of the various physical components of conjunctive water resource system are presented and are discussed in relationship to current institutional controls. (Modified author abstract)

PB-225 800 PC A03/MF A01
 Michigan State Univ., East Lansing. Dept. of Agricultural Economics.
Designing Agricultural Marketing Systems In Developing Countries. (380.141-S825)
 James D. Shaffer. Feb 72, 32p Staff Paper Ser-72-3, AID-380.141-S825
 Contract AID/csd-2826
 Presented at the Agricultural Marketing Conference held in Kathmandu (Nepal), on 21-24 Feb 72. Identifiers: AIDH.

The purpose of this paper is to discuss the design of improved agricultural marketing systems as a means of stimulating economic development. This implies two propositions: (1) that the marketing system can be an active element in the development process and (2) that high performance marketing systems do not develop automatically in response to the needs of a particular situation. Marketing is often neglected in development planning because one or the other or both of these propositions are implicitly rejected. The theme of this paper has been that improved organization and coordination of food production-distribution systems is critical in the effective transformation from a traditional agricultural economy with low productivity to a scientific industrial one with high productivity.

PB-225 933 PC A03/MF A01
 Michigan State Univ., East Lansing. Dept. of Agricultural Economics.
Three Rural Development Models for Small Farm Agricultural Areas In Low Income Nations—Some Results from Comilla, Bangladesh. (BG-301.34095492-S845)
 Staff paper
 Robert D. Stevens. Jun 72, 29p AID-BG-301.34095492-S845
 Contract AID/csd-2826
 Identifiers: AIDH.

The paper provides an outline and analysis of three effective models of programs for small farm agricultural areas based upon ten years experience in Bangladesh. The models are for (1) effective agricultural cooperatives, (2) the improvement of rural government, and (3) for a social science institution which conducts pilot operations, training, and research in rural development. In a broader social science framework, development programs require analysis in the framework of cultural and economic change. The role of models such as the three analyzed here is to provide ways to accelerate change at a productive rate toward desired goals.

PB-225 956 PC A03/MF A01
 Michigan State Univ., East Lansing. Dept. of Agricultural Economics.
The Effectiveness and Financial Stability of the Comilla Agricultural Cooperative Credit System for Small Farmers. (BG-332.71-S845)
 Robert D. Stevens, and Anwarul Hoque. Apr 71, 29p Staff Paper Ser-72-8, AID BG-332.71-S845
 Contract AID/csd-2826
 Presented at a Workshop on 'Agricultural Credit for Small Farmers in Less Developed Countries', held in Arlington, Va., on 6-7 Apr 71. Identifiers: AIDH.

After some introductory remarks providing a framework within which this analysis is made, the paper focuses in Part II on the effectiveness of the Comilla Cooperative System in providing credit to small farmers. The third part of the paper examines the operating procedures and economic stability of the Comilla Agricultural Cooperatives Federation. In the fourth part, some conclusions and discussion of special issues are offered.

PB-226 015 PC E08/MF A01
 American Institutes for Research, Pittsburgh, Pa.
Ability Testing In Developing Countries. A Handbook of Principles and Techniques. (371.264-S411a)
 Handbook 1960-1968
 Paul A. Schwarz, and Robert E. Krug. 1972, 257p AID-371.264-S411a
 Contract AID/csd-798
 Identifiers: AIDH.

SELECTED APPROPRIATE TECHNOLOGIES

An eight-year program of research and development with the objective of devising techniques of aptitude testing that could be applied in cultures in which standard ability tests are not fully effective and to assist in the application of these techniques to human resource development program was conducted under an AID-supported program. The final phase of the project developed and presented the results in the form of this handbook.

PB-226 621/1 PC E06/MF A01
 Cornell Univ., Ithaca, N.Y. Program on Policies for Science and Technology in Developing Nations.
The Natural Resource Potential for Regional Development of Limon Province: A Preliminary Survey
 Oct 73, 162p
 Contract AID/csd-3391

Descriptors: *Natural resources, *Costa Rica, *Economic development, Economic surveys, Regional planning, Industrial relations, Agriculture, Transportation, Livestock, Wildlife, Developing countries.
 Identifiers: *Limon Province(Costa Rica), Tourism, AID.

The study is part of a larger study to understand the appropriate role of science and technology in the development of a small country like Costa Rica. The Limon survey may be described as a broad brush survey of the natural resources existing in the region. This effort comprised gathering data relevant to the survey, evaluating the data, and suggesting studies for formulating policies for regional development. The study was made by a team from Cornell University in cooperation with Costa Rican consultants.

PB-227 591/5 PC A04/MF A01
 Bureau of Labor Statistics, Washington, D.C.
Woodworking, Circular-Saw Accidents
 Final rept. 1951-52.
 Jan 56, 74p Rept no. BLS-Bull-1190
 Also available in set of 56 reports as PB-243 125-SET, PC E99, MF E99.

Descriptors: *Sawmills, *Industrial accidents, Personnel, Sawing, Woodworking, Injuries, Safety engineering, Industrial hygiene, Statistical data, Statistical analysis.

Identifiers: *Occupational safety and health.

The report contains the results of a study of over 1,200 accidents which involved circular saws. Portable circular saws and large circular saws used in sawmills were excluded. State safety inspectors investigated any accident within the scope of the study which they found in the course of performance of their regular duties. Only accidents which occurred during 1951 or 1952 were included. Information about the number of injuries by nature of injury, part of body injured, agency (source) of injury, type of accident, hazardous condition, unsafe act, and activity of injured (feeding, off bearing, etc.) is presented. Descriptions of 22 typical accidents with recommendations for preventing them are included.

PB-227 616/0 PC A11/MF A01
 Southern Illinois Univ., Carbondale. Dept. of Design.
Simplified Housing Construction Systems for Rural Poor Families
 Final rept.
 J. Michael DeRienzo. Jan 73, 241p* Rept no. JMDCONS-73-1

Descriptors: *Residential buildings, *Construction, *Manuals, *Economic factors, *Rural areas, Socioeconomic status, Construction materials, Systems engineering, Structural design, Components, Methodology, Construction costs, Illinois.
 Identifiers: Low cost housing, OUTR.

The volume is designed to familiarize the groups of underprivileged rural inhabitants with simple construction techniques, new materials available, and the exploitation of common but often unrecognized building materials. Use of the latest technology, along with low cost or no cost materials and methods will permit an owner-builder to assemble

a rationalized living unit. Emphasis is on construction techniques which require little skill and time to accomplish.

PB-228 100/4 PC A09/MF A01
 Arizona Univ., Tucson. Office of Arid Lands Studies.
World Desertification: Cause and Effect. A Literature Review and Annotated Bibliography
 Wade C. Sherbrooke, and Patricia Paylore. 1973, 176p* Arid Lands Resource-IP-3, OWRR-W-141(3729)(3)
 Contract DI-14-31-0001-3729

Descriptors: *Deserts, *Land use, *Bibliographies, Arid land, Climatology, Droughts, Precipitation(Meteorology), Land reclamation, Soil erosion, Reforestation, Agriculture, Grazing land, Reviews.

Identifiers: OWRR.

An annotated bibliography is presented of 252 references, computer-produced from the University of Arizona's Arid Lands Information System (ALIS), with accompanying text that reviews briefly both cause and effect of world desertification. Causes fall into two categories: long-term (in the geologic sense) climatic change as supported by meteorological, archaeological, geomorphological, vegetational, palynological, and dendrochronological evidence in the literature; and those activities of man's historic occupancy of arid and semiarid regions that have contributed to degeneration of marginal lands: agricultural and irrigation practices, grazing, fire, nomadism, and sand stabilization and reforestation. Beyond these two categories, there is a third: climatic fluctuation - short-term weather patterns induced by uncertain rainfall and followed by cyclic droughts from which marginal areas may not recover is subjected to continued attempts at intensive use that cannot be sustained by a dry year or a succession of dry years. Portions of this document are not fully legible.

PB-228 348/9 PC A07/MF A01
 National Academy of Sciences, Washington, D.C.
 Board on Science and Technology for International Development.

Meeting the Challenge of Industrialization: A Feasibility Study for an International Industrialization Institute

Aug 73, 145p*

Contract AID/csd-2584

Report of a Special International Panel of the Board on Science and Technology for International Development Office of the Foreign Secretary, Library of Congress Catalog Card no. 73-11740. Summary in Spanish and French.

Descriptors: *Economic development, *Industrial relations, *International relations, *Organizations, *Industrialization, Feasibility, Policies, Transfer of technology, Research, Project planning, Objectives, Developing countries.
 Identifiers: *Institutes, AID.

The report advances the concept of an independent, interdisciplinary research institute to illuminate new policy options confronting all nations. The study was made by an ad hoc advisory panel of the National Academy of Sciences, in consultation with leaders concerned with economic development from developed and developing countries. Appendices: (A) Illustrative research projects, (B) Terms of reference, (C) List of conferees.

PB-229 209/2 PC E06/MF A01
 Housing Assistance Council, Inc., Washington, D.C.

An Analysis of Alternative Low-Income Rural Housing Systems

Final rept.

Gordon Cavanaugh. 29 Jun 73, 137p HUD-PDR-406

Descriptors: *Low income housing, *Rural areas, Public housing projects, Surveys, Problem solving, Recommendations, Economic development districts, Housing agencies, Cost analysis, Defects, Systems analysis, Georgia, Colorado, South Carolina, Mississippi, Tennessee, Vermont.

Identifiers: Alternatives, *Housing and urban development research, OUTR.

The study examines several areas' housing authorities with regard to their public housing alternatives, and outlines the problems of small housing authorities. The report includes a design of a model agency and makes administrative and legislative recommendations.

PB-229 813/1 PC E03/MF A01
 Agency for International Development, Washington, D.C. Office of Science and Technology.

Technological Opportunities for Tropical Forestry Development

Gordon D. Fox. Nov 73, 37p TA/OST-73-21, AID-ARC-634.0-F791

Descriptors: *Tropical woods, *Technology transfer, *Forest industry, *Developing countries, Economic development, Forestry management, United States, Project planning, Utilization characteristics, Socioeconomic conditions, Political objectives, Institutional implications, Improvement, Criteria.
 Identifiers: AID.

The paper is intended to identify the highest pay-off opportunities for the application of U.S. technology to the needs of developing countries for sound management and utilization of forest resources. Specifically the paper includes: (1) development of criteria for determining whether the political-socio-economic and institutional framework in an LDC is sufficiently favorable so that technological inputs will meaningfully improve forest utilization and management; (2) identification of appropriate countries; and (3) examination of a limited number of countries to illustrate how specific technological inputs can be matched with priority needs, and assessment of likely pay-offs.

PB-229 822/2 PC E02/MF A01
 Agency for International Development, Washington, D.C. Office of Science and Technology.

Utilization of Tropical Forests. (A Review of the Forestry Literature in the Agency for International Development Reference Center)

Edward P. Cliff. Nov 73, 31p TA/OST-73-20, AID-ARC-634.98072-C637

Descriptors: *Forestry, *Developing countries, *Reviews, Forest industry, Utilization characteristics, Land use, Trees, Problem solving, Recommendations, Reforestation, Project planning, Improvement, Economic development, Tropical woods, Africa, Latin America, Asia.
 Identifiers: AID.

A review is made of forestry reports, publications, and other documents in the A.I.D. Reference Center to determine information available on utilization problems of secondary tree species in the developing countries. The time span covered is 27 years beginning in 1946. The report identifies forestry and land use problems, and examines recommended measures to upgrade forestry programs and improve utilization of unused and little used species.

PB-230 738/7 PC E02/MF A01
 Forest Service, Washington, D.C.

Factors Influencing the Utilization of Tropical Wood Species

Final rept.

Alan D. Freas, Martin Chudnoff, Robert C. Koeppen, and S. Blair Hutchison. Nov 73, 34p AID-ARC-634.9-F849
 Grant PASA-TA(AJ)-2-73

Descriptors: *Tropical woods, Utilization, Constraints, Reviews, Factor analysis, Economic development, Developing countries.
 Identifiers: AID.

A.I.D. has been concerned, for an extended period of time, over the deleterious practice, in many tropical countries, of concentrating on a relatively limited number of species of tropical woods for exploitation. This investigative report, through review of available literature and on-the-ground consultation in selected countries, attempts to determine

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whether lack of knowledge of secondary species characteristics is the primary deterrent to their increased use, or whether there are other equally and perhaps more important factors to be considered.

PB-231 006/8 PC A05/MF A01
Forest Products Lab., Madison, Wis.
Development of the Tropical Wood Resource
Martin Chudnoff. Nov 73, 76p* TA/OST-73-23
Grant PASA-TA(AJ)-2-73

Descriptors: *Tropical woods, *Forestry management, Reviews, Forest industry, Forest trees, Inventories, Utilization, Identifying, Statistical data.
Identifiers: Silviculture, AID.

The report is one of a series on the subject of tropical forest utilization and management. The report covers the period 1950-1970 and focuses on a few selected countries with emphasis on definition of forests. It is based mostly on a library study and is divided into seven parts: Literature review; forest flora; commercial species; forest enumerations; silvicultural systems; characterization of primary species; and ten-year summary of roundwood removals, production, and trade.

PB-231 144/7 PC A04/MF A01
Mitre Corp., McLean, Va.
Dissemination and Utilization of Solar Energy Research Results. Report to the Office of Systems Integration and Analysis Directorate of Applied Research, National Science Foundation

Final rept.
Richard S. Greeley. Dec 73, 69p MTR-6544,
NSD-RA/N-73-111D
Contract NSF-C831
See also PB-231 145.

Descriptors: *Solar energy, *Research projects, *Project management, Distributing, Utilization.
Identifiers: Technology transfer, NSFRA.

Thirty recommendations have been made for establishing groups within or reporting to the NSF Solar Energy Program Office and initiating activities for the dissemination and utilization of solar energy research results. The primary recommendations include establishing an Advisory Commission and an information office reporting to the Program Director and constructing visitor centers on the sites of each Proof of Concept Experiment. Training courses and public education would be conducted at each center following successful operation of the POCE system. (Modified author abstract)

PB-231 149/6 PC A07/MF A01
Massachusetts Univ., Amherst.
Proceedings of the Bioconversion Energy Research Conference Held at Massachusetts Univ., Amherst on 25-26 June 1973
26 Jun 73, 129p* NSF-RA/N-73-007
Grant NSF-GI-39215

Descriptors: *Solid waste disposal, *Materials recovery, *Methane, *Meetings, Digestion(Decomposition), Anaerobic processes, Refuse disposal, Garbage disposal, Sewage disposal, Manufactured gas.
Identifiers: *Methane digestion, NSFRA.

The two-day conference addressed itself to the question of biological conversion of waste and feedlot materials to methane. The specific objectives of the conference were: to exchange recent research information between engineers and scientists on research accomplishments and problems related to bioconversion studies; to contribute to the long-range planning of the funding agencies and research workers in the field; to provide improved communications between the research community and the users' groups; to identify the processes and technology important to the production of methane from waste and feed lot materials; to identify the important economic factors associated with bioconversion processes. These proceedings consist of the summary statements provided by each principal speaker at the conference, together with a transcript of essentially all of

the tape-recorded question-and-answer period that followed each presentation.

PB-231 200/7 PC A21/MF A01
Office of Water Resources Research, Washington, D.C. Water Resources Scientific Information Center.

Evaporation Suppression. A Bibliography
Dec 73, 483p* WRSIC-73-216, W74-06501

Descriptors: *Evaporation control, *Evapotranspiration, *Bibliographies, Irrigation, Monomolecular films, Arid land, Abstracts, Water conservation, Reservoirs, Evaporation, Soil water, Transpiration.
Identifiers: OWRR.

This report, containing 320 abstracts, is another in a series of planned bibliographies in water resources to be produced from the information base comprising SELECTED WATER RESOURCES ABSTRACTS (SWRA). At the time of search for this bibliography, the data base had 64,268 abstracts covering SWRA through November 1, 1973 (Volume 6, Number 21). Author and subject indexes are included.

PB-231 269/2 PC E03/MF A01
Oregon Univ., Eugene. Bureau of Governmental Research and Service.

Rural Transfer and Modified Landfill. A Comparison of Cost Indicators for Low Volume Rural Solid Waste Disposal Methods
Dec 73, 45p

Descriptors: *Solid waste disposal, *Rural areas, *Management planning, Costs, Transportation, Oregon.

Identifiers: Sanitary landfills, Lane County(Oregon), Waste transfer stations, EPASW.

One of the key considerations in selecting a system of solid waste management is the relative costs of the available alternative systems. This report was prepared in order to provide public officials and solid waste management planners with information upon which they can base estimated costs of operating a rural transfer system as well as a modified landfill system. The suggested estimating techniques are compatible and permit comparison of the estimated costs of these two alternative management systems. The experience of the Lane County, Oregon Solid Waste Division provided the basis for development of the cost estimating techniques outlined in this report.

PB-231 391/4 PC E04/MF A01
Transport and Road Research Lab., Crowthorne (England).

The Compaction of Soils and Stabilized Bases on Road in East Africa
M. P. O'Reilly. 1974, 75p Rept no. TRRL-LR-600

Descriptors: *Pavement bases, *Soil compacting, Roads, Soil stabilization, Soil water, Tropical regions, Construction, Test methods, Sands, Clay soils, Gravel, Porosity, Africa, Great Britain, Subsaharan Africa.

Identifiers: GBRRL.

As part of a study of aspects of normal road-building practice in tropical countries, the states of compaction achieved in road bases and earthworks were investigated at ten road construction schemes in East Africa. In addition, where possible, controlled compaction trials were carried out. The most significant conclusion from the investigation is that the states of compaction achieved in the field correspond quite closely with those obtained in full-scale compaction tests carried out at the Transport and Road Research Laboratory. The study showed that the states of compaction commonly specified for tropical roads can be attained under normal working condition. (Modified author abstract)

PB-231 485/4 PC E03/MF A01
Texas Water Development Board, Austin. Systems Engineering Div.

Techniques for Identifying and Evaluating Market and Non-Market Benefits and Costs of Water Resource Systems

Completion rept.
Milton L. Holloway. Jun 73, 24* OWRR-C-3352(3738)(1)
Contract DI-14-31-0001-3738

Descriptors: *Water resources, *Systems analysis, *Water economy, Water management, Benefit cost analysis, Allocations, Socioeconomic conditions, Economic development, Policies, Mathematical models, Demand(Economics), Simulation, Regional planning, Environments, Whitney Lake, Lewisville Lake, Belton Lake, Texas.
Identifiers: Aquatic environments, Water demand, OWRR.

The research project was designed to provide a set of analytical tools for water resource planners and decision-makers to assist them in measuring and evaluating the market and non-market benefits and costs of water resource systems. The techniques are designed to be sufficiently flexible to analyze all types of water development and management policies. The report describes: (1) the techniques developed to measure the economic, environmental, and social impacts of water policy alternatives, and (2) the application of these techniques to a test case of three existing reservoirs to determine the method's efficacy. The analyses are conducted in three major areas: economic, environmental, and social. (Modified author abstract)

PB-232 292/3 PC E07/MF A01
Housing Assistance Council, Inc., Washington, D.C.

An Analysis of Alternative Methods of Rural Home Repair
Final rept.
Gordon Cavanaugh. 29 Jun 73, 175p HUD-PDR-431

Descriptors: *Rural occupied housing units, *Residential alterations and repairs, Methodology, Demography, Feasibility, Financing, Rehabilitation, Federal programs, Legislation, Income level, Subsidies, Models, Recommendations.
Identifiers: *Alternatives.

An analysis is made of home repair alternatives which are understandable only within a context of the housing conditions and the prevailing resources in rural America. Various recommendations were made with respect to new institutions, changes, and reforms for the report.

PB-232 307/9 PC E03/MF A01
NAHB Research Foundation, Inc., Rockville, Md.
Small Sewage Treatment Systems. Experience and Cost Data in 61 Subdivisions in 12 States 1959, 48p

Descriptors: *Sewage treatment.

Contents: Policy; Costs; legislation; aesthetic considerations; what is sewage treatment; degree of treatment needed; stage construction for flexibility; operation and maintenance; successful sewerage installations; and incorporating sewage collection and treatment in the subdivision plan.

PB-234 503/1 PC E04/MF A01
National Research Council, Washington, D.C. Building Research Advisory Board.

Roofing in Developing Countries. Research for New Technologies
1974, 85p
Contract AID/csd-2584
Library of Congress Catalog Card no. 73-10037

Descriptors: *Roofing, *Developing countries, Roofs, Housing shortages, Binders(Materials), Plastics, Cellular plastic, Sulfur, Plant fibers, Wood wastes, Reinforced concrete, Clays, Fibers, Thermoplastic resins, Reinforcing materials, Composite materials, Cements, Asphalts, Iron, Agricultural wastes, Cost analysis.
Identifiers: Ferrocement.

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More than 80 developing countries suffer from an acute housing shortage, principally because of the ever-increasing need for new housing created by expanding populations and the periodic large-scale loss of housing from natural disasters. The report presents the committee's conclusions and recommendations concerning areas of research and kinds of materials indicating significant potential for the development of new roofing technologies that could provide early solution to the particular problems of developing countries. Ten appendices address various technical aspects of potential new roofing technologies.

PB-234 536/1 PC A05/MF A01
Massachusetts Inst. of Tech., Cambridge. Energy Lab.

Interfuel Substitution in the Consumption of Energy in the United States. Part I: Residential and Commercial Sector

Martin L. Baughman, Paul L. Joskow, and Frederick S. Zerhout. 25 May 74, 97p. Rep no. MIT-EL-74-002
Grant NSF-GI-39150

Descriptors: *Fuel consumption, Economic models, Electric power demand, Econometrics, Economic analysis, Mathematical models, Natural gas, Fuel oil, Prices, Cost comparison, Rates(Costs), Residential buildings, Substitutes, Heating fuels, United States.

Identifiers: Energy policy, *Interfuel competition.

A conceptual model used for fuel choice decisions is given and empirical results presented for appliance choices in the residential sector for four selected appliances and for the fuel-split of aggregate energy consumption among three fuels. Determinants of total energy demand in the residential and commercial sectors are covered along with a simple flow adjustment model. Estimated relationships are used to make projections to 1980 for alternative price scenarios.

PB-235 410/8 PC A05/MF A01
National Academy of Sciences-National Research Council, Washington, D.C.

Food Science In Developing Countries: A Selection of Unsolved Problems

1974, 92p.
Contract AID/csd-2584
Library of Congress Catalog Card No. 74-1602.

Descriptors: *Human nutrition, *Food, *Developing countries, New technology, Resources, Preserving, Processing, Storage, Food composition, Food deterioration, Problem solving.

The report presents a collection of selected problems in the fields of food science and nutrition which are of immediate concern to developing countries. Each problem is organized under the following headings: Problem description; background information; possible approaches to a solution; special requirements; bibliography; and key contact(s).

PB-235 575/8 PC A07/MF A01
Oklahoma Cooperative Fishery Unit, Stillwater.
Paunch Manure as a Feed Supplement In Channel Catfish Farming

Environmental protection technology series
Robert C. Summerfelt, and S. C. Yin. May 74, 129p EPA-600/2-74-046
Grant EPA-R-800746

Paper copy available from GPO \$1.60 as EP-1.23:660/2-74-046.

Descriptors: *Catfishes, *Aquaculture, *Water pollution, Feeding stuffs, Agricultural wastes, Beef cattle, Water quality, Animal nutrition, Diets, Food processing, Ponds.
Identifiers: Water pollution effects(Animals), Paunch manure, Slaughtering house wastes.

Part A of the report examines the feasibility of using dried paunch at 10, 20, and 30% levels in feed for pond-rearing yearling channel catfish to market-size, and at a 10% level for cage-culture of yearling catfish. Part B describes the effects of fish culture, using standard feeds and paunch-containing feeds, on water quality of fish ponds. In all, one

physical, one bacteriological, and fifteen chemical parameters were measured. Regardless of feed type, pond-reared fish grew faster than the cage-reared fish. There was no significant difference in final weights attained by fish given standard, and 10 and 20% paunch feeds but fish given 30% paunch were significantly smaller. Neither the pond culture nor the cage culture caused deterioration in water quality in any of the ponds to any appreciable degree in one growing season of 24 weeks. (Modified author abstract)

PB-235 801/8 PC E02/MF A01
Pacific Southwest Forest and Range Experiment Station, Berkeley, Calif.

Some Woods of Hawaii...Properties and Uses of 16 Commercial Species

Forest Service general technical rept. (Final)
Roger G. Skolmen. 1974, 34p Rep no. FSGTR-PSW-8

Descriptors: *Wood, *Wood products, *Hawaii, Eucalyptus wood, Ash wood, Redwood, Mechanical properties, Woodworking, Shrinkage, Durability.

Information is given for 16 Hawaii-grown species, both native and introduced, of present or potential commercial importance. Descriptive notes include tree characteristics, history, size, and growth rates; the timber volume available in Hawaii, and accessibility for logging. Wood properties, including appearance, weight, shrinkage, strength, workability, seasoning, durability, and finishing, are explained with reference to well-known woods, and present and potential uses are described. An appendix includes technical data. Each species is illustrated in color.

PB-236 285/3 PC A03/MF A01
Department of Housing and Urban Development, Washington, D.C. Office of International Affairs.

Special Report on Techniques of Aided Self-Help Housing. Some Examples of U.S. and Overseas Experience

Ervan Bueneman. Nov 73, 29p

Descriptors: *Self help housing, *Developing countries, Houses, Construction, Projects, Puerto Rico, Guatemala, Tanzania, Trinidad.

In some developing countries, helping families build their own homes became the basis of national housing policy long after the departure of the experts who first introduced and developed the concept. Organized aided self-help housing programs are considered a way by which many families could obtain decent housing through their own efforts at a relatively small capital expenditure. The report describes selected experiences in Puerto Rico, Trinidad/Tobago, Guatemala, Tanzania, and selected U.S. areas.

PB-236 391/9 PC A05/MF A01
PADCO, Inc., Washington, D.C.

Guidelines for Establishing and Administering Land Development Agencies in the Developing Countries

Ideas and methods exchange
Alfred P. Van Huyck, and Milton Kaplan. Aug 73, 76p (ME-69)

Contract HUD-H-1899
Sponsored in part by Agency for International Development Washington, D.C.

Descriptors: *Land development, *Developing countries, *Services, Urban areas, Urban planning, Public administration, Reviews, Recommendations, Management guidelines.
Identifiers: *Government agencies.

The report examines the crisis in urban land from the perspective of one instrument available to the public sector - the Land Development Agency - through which the public interest can be represented in the urban land market. It is not intended to be an exhaustive study of world experience, but rather a basic review of the key issues of concern and the preparation of recommendations and guidelines for the establishment and administration of Land Development Agencies. Its purpose is to stimulate interested persons to undertake further studies

leading to the improvement of land development agencies in the developing countries.

PB-236 978/3 PC A02/MF A01
Department of Housing and Urban Development, Washington, D.C. Office of International Affairs.
HUD International Country Reports. Panama
1971, 15p Rep no. HUD-168-SF
See also PB-236 979.

Descriptors: *Housing studies, *Urban development, *Panama, Developing countries, Urban construction, Economic conditions, Construction industry, Construction materials, International trade, Foreign market surveys, Foreign investments.
Identifiers: *International country reports.

The report presents information on various aspects of housing and urban development in Panama. The information was developed from the analysis of foreign documents, team visits, document exchanges under bilateral agreements and from informal contacts. Each study describes geography, climate, population, the government system, some economic data, and housing and urban development activity, including financial institutions.

PB-236 980/9 PC A02/MF A01
Department of Housing and Urban Development, Washington, D.C. Office of International Affairs.
HUD International Country Reports. Peru
1971, 18p Rep no. HUD-275-IA
See also PB-236 981.

Descriptors: *Housing studies, *Urban development, *Peru, Developing countries, Urban construction, Economic conditions, Construction industry, Construction materials, International trade, Foreign market surveys, Foreign investments.
Identifiers: *International country reports.

The report presents information on various aspects of housing and urban development in Peru. The information was developed from the analysis of foreign documents, team visits, and document exchanges under bilateral agreements and from informal contacts. Each study describes geography, climate, population, the government system, some economic data, and housing and urban development activity, including financial institutions.

PB-237 069/0 PC A02/MF A01
Nevada Univ., Reno. Center for Water Resources Research.

Arid Basin Management Model with Concurrent Quality and Flow Constraints. Phase I
Project rept. no. 24
Richard L. Bateman, Alfred B. Cunningham, and Jerome A. Westphal. Jan 74, 22p OWRT-C-4190(9031)(1)
Contract DI-14-31-0001-9031

Descriptors: *Water quality management, *Water supply, *Irrigation, *Nevada, *Arid land, Water resources, Drainage, Irrigation pipes, Floods, Trees(Plants), Mathematical models, Time series analysis, Stream flow, Evaluation.
Identifiers: Water quality, Dendrochronology, Water quality data, Flood irrigation.

The report presents the development of an inorganic water quality-flow management model in which both water supply and quality criteria are considered for formulation of operating rules. Truckee-Carson system of northwest Nevada is being used as a prototype. Evaluation of flow and quality data show that the Carson system is generally amenable to application of the type of inorganic quality-simulation model previously developed on the Tahoe-Truckee portion of the Truckee-Carson system. Preliminary predictive relations of the type utilized in the quality simulation model are developed for several sites within Carson system. Problems encountered in development of sound predictive relations in river reaches where intensive irrigated agriculture is practiced are discussed.

PB-237 338/9 PC A03/MF A01
Nevada Univ., Reno. Desert Research Inst.

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Desert Research Institute, Annual Report, 1970-1971
1971, 39p OWRT-A-999-NEV(3)

Descriptors: *Water resources, *Water management, *Water economy, Allocations, Project planning, Research projects, Water supply, Grants, Water quality, Hydrogeology, Nucleation, Expenses, Universities, Nevada, Arid land.

The report presents highlights of selected investigations underway during fiscal year 1971. The Center for Water Resources Research is one of five research groups at the Desert Research Institute. Nevada's water problems are chiefly in the areas of development and management of the state's limited water resources. These and closely related problem areas received emphasis in the program of the Center for Water Resources Research.

PB-238 103/6 PC A08/MF A01
National Center for Energy Management and Power, Philadelphia, Pa.
Technology for the Conversion of Solar Energy to Fuel Gas
Annual rept.
31 Jan 74, 153p NSF/RANN/SE/GI34991/PR73/4, NSF/RA/N-74-153
Grant NSF-GI-29729, NSF-GI-34991

Descriptors: *Methane, *Manufactured gas, *Gas production, *Plants(Biology), *Digestion(Decomposition), Fermentation, Newsprint, Absorbent papers, Grasses, Garbage, Chlrella, Algae, Fertilizers, Wastes, Feeding stuffs, Mud, Agricultural wastes, Effluents, Anaerobic processes, Digesters, Fresh water, Brackish water, Sea water, Production rate, Alkalinity, Carbon dioxide, Nitrogen, Carbon, Solar energy, Chemical analysis, Photosynthesis, Biodegradation.

Identifiers: *Solar energy conversion.

The formation of methane by biological conversion of a number of organic materials has been examined. The materials exposed to the anaerobic fermentation process included paper, grass, household garbage, fresh water algae, water hyacinth, seaweed, cattle manure, dry manure, dry dog food. These materials have been examined separately and in various combinations. During operation of the digester, the amount and composition (methane and carbon dioxide) of the gases produced by the fermentation were determined and extensive chemical analyses of the composition of the liquid contents of the digesters were carried out. Similar chemical analyses of the various materials fed to the digester were carried out as well as analyses of the sea water used in several of the studies.

PB-238 591/2 PC A02/MF A01
Kansas State Univ., Manhattan. Cooperative Extension Service.
Guidelines for Land Disposal of Feedlot Lagoon Water
Research rept.
William L. Powers, Russell L. Herpich, Larry S. Murphy, David A. Whitney, and Harold L. Manges. 1974, 9p OWRT-A-046-KAN(2)
Contract DI-14-31-0001-3516

Descriptors: *Industrial waste treatment, *Agricultural wastes, Irrigation, Waste water, Lagoons(Ponds), Nutrients, Salts, Water quality, Inorganic nitrates, Inorganic phosphates, Kansas, Farms.

Identifiers: *Feedlot wastes, Water quality data.

Guidelines are provided for feedlot operators who dispose of lagoon water on agricultural lands. The design of lagoon, pumps, and irrigation systems are not discussed. Because lagoon water contains such plant nutrients as nitrogen, phosphorus, and potassium, its application on agricultural land, in correct amounts, can increase crop yields. However, because it also contains salts of sodium, calcium, and magnesium, too much lagoon water can pollute the soil. The salt accumulation from lagoon water is most likely to occur in dry areas where precipitation is not adequate to leach the salts downward below the root zone. Guidelines on how to dispose of such lagoon water to minimize the

chance of reducing the land's productivity are given. The guidelines are based on present irrigation-water-quality standards and on data collected from various feedlots in Kansas.

PB-238 849/4 PC A11/MF A01
National Academy of Sciences, Washington, D.C.
African Agricultural Research Capabilities
1974, 240p* Rept no. ISBN-0-309-0224-X
Contract AID/csd-2584

Descriptors: *Agriculture, *Research projects, *Developing countries, *Africa, Research needs, Education, Soils, Agronomy, Land use, Farm crops, Agricultural economics, Manpower, Water management, Grains(Food), Vegetables, Livestock.

The study focuses on the question of how agricultural science and specifically agricultural research can contribute most effectively to the progress of the African nations and peoples. It covers the following topics: (1) Agricultural and educational priorities; (2) role of non-African agencies in coordination of agricultural research and education; (3) appropriate channels of communication and cooperation among nations and institutions within and outside of Africa; (4) means by which research and education can be applied most effectively to African agricultural development; and (5) a broad assessment of the scientific manpower needs of the research systems and institutions recommended by the NAS Committee.

PB-238 917/9 PC A21/MF A01
International Road Federation, Washington, D.C.
1974 World Survey of Current Research and Development on Roads and Road Transport
Dec 74, 497p*
Contract DOT-FH-11-7656, CPR-11-2665
Sponsored in part by contract DOT-FH-11-6744.

Descriptors: *Highways, *Highway transportation, *Highway planning, Research, Reviews, Bibliographies, Bridges(Structures), Foreign countries, Objectives, Organizations, Recommendations, Construction materials, Roads, Project planning, Developing countries, Civil engineering, Tunnels.

The tenth in a series of annual reports on research and development projects conducted by governmental, academic and commercial research agencies in 72 countries is reported by surveyors of the International Road Federation and the International Road Research Documentation program of the OECD. The report includes listings of 4,668 projects, classified in accordance with the subject area classification of the Transportation Research Board, which includes these listings in their retrieval system.

PB-239 230/6 PC A04/MF A01
New Mexico State Univ., University Park. Water Resources Research Inst.
Water Resources Evaluation of the Southern High Plains of New Mexico
Technical completion rept.
Robert R. Lansford, Willem Brutsaert, Bobby J. Creel, Adan Flores, and Walter Loo. Jul 74, 68p
WRRI-044, OWRT-B-037-NMEX(1)

Descriptors: *Water resources, *Economic development, *New Mexico, Hydrogeology, Mathematical models, Ground water, Water quality, Economic models, Water management, Linear programming, Population growth, Employment.

Identifiers: Water demand, Water requirements.

An interdisciplinary approach to the solution of the water resource problems of the Southern High Plains in New Mexico was made possible by the integration of hydrology and geology with economics. Research procedures developed to carry out this study were closely coordinated by the investigators to achieve the primary objective of evaluation of the social and economic impacts of alternative water-use policies. A linear programming model was developed to represent the Southern High Plains economy. Inputs into the model were obtained from separate studies covering the hydrological, agricultural, municipal, and industrial areas.

PB-239 465/8 PC A16/MF A01
Little (Arthur D.), Inc., Cambridge, Mass.
An Overview of Alternative Energy Sources for LDCs
7 Aug 74, 372p* Rept no. ADL-C-77105
Contract AID/ta/C-1089

Descriptors: *Electric power generation, *Energy supplies, *Developing countries, Energy sources, Tidal power generation, Geothermal power plants, Geothermal prospecting, Wastes, Methyl alcohol, Coal gasification, Wind power generation, Solar energy conversion, Solar heating, Solar power generation, Nuclear electric power generation, Steam electric power generation, Bangladesh, Chile, Costa Rica, Dominican Republic, Ghana, India, Ivory Coast, Kenya, Pakistan, Brazil, Korea, Niger, Philippines, Sri Lanka, Thailand, Underdeveloped nations, International trade, Energy consumption, Fuel consumption, Electric power demand, Forecasting, Predictions, Economic development.

Identifiers: Energy resources.

The report presents an overview of alternative energy sources of types which could be of significant value to lesser-developed countries in adjusting to the impact of sharply higher world market prices of petroleum. It presents a highly condensed review of non-conventional energy technologies, together with some limited commentary on the relevance of the more conventional technologies in new lesser-developed country (LDC) economic settings. It also provides a summary on a country-by-country basis of the current economic posture and energy resources array in fifteen LDC's selected as being broadly representative--geographically and in terms of petroleum-price impacts--of the quite wide range of situations that need to be considered.

PB-239 472/4 PC A08/MF A01
National Academy of Sciences, Washington, D.C.
Advisory Committee on Technology Innovation.
More Water for Arid Lands, Promising Technologies and Research Opportunities
1974, 161p
Contract AID/csd-2584

Descriptors: *Water supply, *Water conservation, *Arid land, Agriculture, Irrigation, Waste water reuse, Surface water runoff, Water wells, Remote sensing, Water loss, Soil water, Evapotranspiration, Salt water, Percolation, Controlled atmospheres.

Little known but promising technologies for the use and conservation of scarce water supplies in arid areas are the subject of this report. Not a technical handbook, it aims to draw the attention of agricultural and community officials and researchers to opportunities for development projects with probable high social value. Each technology is presented in a separate chapter and arranged under the following topics: methods, advantages, limitations, stage of development, needed research and development, selected readings (a short list of reviews and general articles) and contacts (a list of individuals or organizations the panelists know to be involved in relevant research).

PB-239 493/0 PC A12/MF A01
Monsanto Research Corp., Dayton, Ohio. Dayton Lab.
Development of Low-Cost Roofing From Indigenous Materials In Developing Nations
Annual rept. no. 1, May 73-May 74
G. L. III Ball, Robert A. Cass, J. P. R. Falconer, D. C. Royse, and Ival O. Salyer. 30 Jul 74, 274p
Rept no. MRC-DA-440
Contract AID/CM/ta-C-73-12
Prepared in cooperation with Washington Univ., St. Louis, Mo.

Descriptors: *Roofing, *Developing countries, *Construction materials, Feasibility, Research, Natural fibers, Fillers, Substitutes, Low cost housing, Project planning, Africa, Asia, Latin America, Reviews.

Identifiers: *Indigenous materials.

The report covers the first year of a 1973-1976 research effort to use indigenous fibers and fillers

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with low-cost binders to produce improved roofing for developing countries. The ultimate goal of the development program is to make available in at least three countries, one each in Africa, Asia and Latin America, a roofing system which is an economically and technically acceptable alternative to the extensively used corrugated galvanized iron, a material which has undesirably high foreign exchange costs, insufficient use of indigenous materials and manpower, and poor thermal insulation and durability. Phase 1 goals are summarized, and a work plan for Phase 2 is given.

PB-239 875/8 PC A06/MF A01
 Maryland Univ., College Park. Bureau of Business and Economic Research.
Effects of Economic Development Upon Water Resources (An Interindustry Approach to Modeling Economic-Environmental Systems)
 Technical rept.
 John H. Cumberland, and Bruce N. Stram. 1974, 111p TR-18, OWRT-B-007-MD(1)
 Contract DI-14-31-0001-3089

Descriptors: *Water pollution, *Management planning, *Water resources, *Air pollution, *Economic development, Economic models, Mathematical models Statistical methods, Classifications, Sources, Residues, Waste disposal, Economic analysis.

Identifiers: *Water pollution abatement, Environmental models, *Environmental management, Formats.

A theoretical model is presented of interrelationships between economic and environmental models useful for water management, together with basic data on 130 types of pollutants from 70 different industries. The purpose is to get good data and analytic methods needed to improve environmental management. The first step has been to devise a materials balance accounting structure to provide a format for emissions. The collected and internally developed data have been used to create a simple two-stage model of the emissions process. High priority in environmental research appears appropriate for the evaluation of damage functions associated with various reported emissions levels. Integration of this additional information with the data on hand should lead to the improvement desired in environmental management.

PB-240 113/1 PC A04/MF A01
 Oregon State Univ., Corvallis. Water Resources Research Inst.
Animal Waste Conversion Systems Based on Thermal Discharge
 L. Boersma, E. W. R. Barlow, J. R. Miner, and H. K. Phinney. Sep 74, 58p OWRT-B-039-ORE(1)
 Contract DI-14-31-0001-4121
 Also available as Oregon State Univ., Corvallis. Agricultural Experiment Station. Special rept. no. 416.

Descriptors: *Agricultural wastes, *Manufactured gas, *Heat recovery, *Solid waste disposal, *Feeding stuffs, Algae, Cooling water, Electric power plants, Methane, Byproducts, Digestion(Decomposition), Digestors, Anaerobic processes.

Identifiers: *Waste heat utilization, *High protein supplements, *Manure.

Society faces many problems related to its growth in numbers and standard of living. Of major concern is environmental degradation resulting from pollution and the consumptive use of non-renewable natural resources. An animal waste management scheme was developed on the premise that one solution to these problems is the development of integrated production systems with recycled sources. The waste product of one industry must become the raw material for another. The feasibility of using waste heat from steam electric plants to sustain a food-producing complex which recycles nutrients is analyzed. Specifically, it is proposed to use microorganisms to convert animal waste into a high protein animal feed and a methane-rich fuel gas. Waste heat from steam electric plants is used as a low cost source of energy for maintaining stable, elevated temperatures in anaerobic digestion and single cell protein production units. Benefits to society include: improved effi-

ciency of energy use and food production, recycling of raw materials, and conservation of non-renewable resources.

PB-240 244/4 PC A03/MF A01
 National Academy of Sciences, Washington, D.C.
An International Centre for Manatee Research: Report of a Workshop held 7-13 February 1974 in Georgetown, Guyana, South America
 1974, 39p*
 Contract AID/csd-2584

Descriptors: *Weed control, *Aquatic animals, *Meetings, Mammals, Ecology, Research, Biology, Guyana, Developing countries, Tropical regions.
 Identifiers: *Aquatic weed control, *Biological weed control, *Manatee, Trichechus.

A workshop was held in Georgetown, Guyana February 7-13, 1974 to discuss the potential usage of the manatee as a natural means of aquatic weed control as well as of the great advantages, apart from its utilitarian potential, that may be derived through basic biological research endeavors. The report outlines the various fields of research which need to be undertaken if the manatee is to be brought into effective use and the establishment of an International Centre for Research on Manatees has been recommended.

PB-240 299/8 PC A03/MF A01
 Colorado State Univ., Fort Collins. Dept. of Agricultural Engineering.

Optimal Allocation of Water Quality Controls In Urbanizing River Basins
 Wynne R. Walker, Gaylord V. Skogerboe, and Thomas L. Huntzinger. 21-26 Oct 73, 28p OWRT-B-083-COLO(7)

Paper presented at the American Water Resources Conference (9th) Held in Seattle, Washington on 21-26 Oct 73.

Descriptors: *Water quality management, *Urbanization, *River basin development, *Utah Lake, Irrigation, Potable water, Utah, Arid land, Government policies, Mathematical models, Optimization, Land use.

Urbanizing river basins in the west are encountering serious water quality degradation resulting from the expanded water utilization. In order to avoid aggravating such conditions, water quality controls need to be implemented. The important questions are, therefore, where and how to impose such constraints on the urban and agricultural sectors to achieve the desired level of pollution control. An application of the model developed to address such questions is made in the Utah Lake drainage area of Central Utah as a test of the model's utility. The region is subdivided into five major sub-basins containing both municipal and agricultural water demands. A submodel of each subbasin is developed which optimizes the water quality control strategies by linking the urban to the agricultural uses and then evaluating the levels of control for each sector. From these results, a cost-effectiveness function for each sub-basin is generated. By jointly considering the cost-effectiveness relationship for each sub-basin, an optimum policy for the entire basin is determined.

PB-240 365/7 PC A07/MF A01
 Humboldt County Dept. of Public Works, Eureka, Calif.

Rural Storage and Collection Container Systems

Final rept.
 Bartle Wells. 1975, 126p EPA/530/SW-81d
 Grant PHS-EC-00271

Prepared in cooperation with Bartle Wells Associates, San Francisco, Calif., and Garretson, Elmhendorf, Zinor, and Reibin, San Francisco, Calif. Report on Humboldt County Solid Waste Demonstration Project. See also PB-212 398.

Descriptors: *Solid waste disposal, *Refuse disposal, *Containers, *Collection, *Rural areas, Storage, Management planning, Cost analysis, Trucks, Earth fills, Hauling, Compacting, Financing, California.

Identifiers: Waste transfer stations, Sanitary landfills, *Humboldt County(California).

This report describes the development and financing of a county solid waste collection system for rural areas. The objective of the system was to substitute an environmentally sound method of solid waste disposal for the unsound practice of using small, random, burning dumps. The report shows that this can be accomplished. It presents a detail description of the storage and collection containers used, the construction of the container sites, and an economic analysis of the advantages/disadvantages of the use of small and large containers. The report also presents a comprehensive analysis of the development of the County financial plan.

PB-240 695/7 PC A03/MF A01
 Bureau of Mines, Spokane, Wash. Spokane Mining Research Center.
Engineering Properties of Fiber-Reinforced and Polymer-Impregnated Shotcrete
 Rept. of investigations 1975
 M. E. Poad, M. O. Serbousek, and J. Goris. Jan 75, 31p Rept no. BuMines-Rl-8001

Descriptors: *Shotcrete, *Polymers, Steel, Fibers, Reinforcement(Structures), Compressive strength, Tensile properties, Flexural strength, Mining engineering, Underground supporting, Underground mining.
 Identifiers: Fiber reinforced concretes, Ferrocement, Concrete polymer composites.

Structural properties of steel fibrous shotcrete and polymer-impregnated shotcrete, both plain and fibrous, were investigated. Flexural strengths can be increased to 106 percent and splitting tensile strengths 50 percent by introducing randomly oriented steel fibers. Polymer-impregnated shotcrete exhibited a threefold to fourfold increase in compressive and splitting tensile strength. Physical properties include compressive and splitting tensile strengths, tangent and secant moduli, stress-strain curves, and flexural strengths for control and fibrous shotcrete are reported. This investigation concerns new and improved methods of using concrete as an underground support in mines.

PB-241 055/3 PC E03/MF A01
 National Center for Energy Management and Power, Philadelphia, Pa.
Technology for the Conversion of Solar Energy to Fuel Gas
 Quarterly rept. no. 3.
 31 Oct 73, 145 NSF/RANN/SE/GI34991/PR/73/3, NSF/RA/N-73-113
 Grant NSF-GI-29729, NSF/GI-34991
 See also PB-238 545.

Descriptors: *Methane, *Organic wastes, *Manufactured gas, *Digestion(Decomposition), Digesters, Equipment, Design, Drawings, Performance evaluation, Plants(Botany), Agricultural wastes.

Development of methods for the economic production of methane gas by the anaerobic digestion of organic matter is discussed. The organic matter is derived from the conversion of solar energy to plant material via photosynthesis. An initial source of feed material is available in the form of organic solid wastes, the by-products of food, feed and wood production. The conversion of waste materials to fuel gas via anaerobic digestion represents a potential solution not only to the energy problem, but simultaneously to the solid wastes problem.

PB-241 120/5 PC A17/MF A01
 Virginia Polytechnic Inst. and State Univ., Blacksburg. Center for Urban and Regional Studies.
Urban Systems Research: Report of the Bina-tional (U.S./Australian) Urban Systems Symposium (1st)
 Final rept.

John W. Dickey, and Roy W. R. Muncey. Apr 75, 398p* NSF/DS-74/01
 Prepared in cooperation with Commonwealth Scientific and Industrial Research Organization, Victoria (Australia). Div. of Building Research, and Department of Science, Canberra (Australia).

Descriptors: *Urban planning, *Urban development, *Meetings, Land use, Urban growth, Develop-

SELECTED APPROPRIATE TECHNOLOGIES

oping countries, Community development, Citizen participation, United States, Australia.

In June, 1974 the First Binational (U.S./Australian) Symposium on Urban Systems Research was held in Washington, D.C. There were 29 presentations made by experts from the two countries. These covered such areas as (1) land use models (Lowry-type, NBER, PLUM, EMPIRIC), the Direct Trip Allocation Model, System Dynamics), (2) growth allocation techniques, (3) growth management, (4) the experience of practitioners with models, (5) urban problems and practices in developing countries, (6) the United Nations' Habitat '76 Program, (7) organizing government, (8) community involvement, (9) gaming, (10) land use law, and (11) national growth policies. It was concluded from the symposium that much more work needs to be done in urban modeling, especially because of rapid changes in uncontrollable, external factors.

PB-242 025/5 **PC A12/MF A01**
 Utah Water Research Lab., Logan.
Water Resources Planning, Social Goals, and Indicators: Methodological Development and Empirical Test
 Final rept.
 31 Dec 74, 267p* PRWG-131-1, OWRT-C-4330(9049)(1)

Descriptors: *Water resources, *Social goals, *Economic development, Mathematical models, Social welfare, Federal policies, Decision making, Management information systems, Conservation, Recreation, Esthetics, Attitudes, Field tests, New Mexico.
 Identifiers: Social indicators.

A methodology for comprehensive evaluation of water resources development and use (TECH-COM) has been developed and partially field tested. A model of three societal goals consists of nine primary goals successively articulated into increasingly specific subgoals. Achievement of subgoals is perceived as affected by measurable social indicators whose values are perturbed by water resources actions. Linking the elements of the goal taxon by connectives results in an evaluation system. Historical, political and philosophical considerations of the proposed system are discussed in Part I. Part II describes the results of the Rio Grande of New Mexico test including public perception and weighing of the subgoals and goals, and development of specific connectives. Future values of 128 social indicators for five action plans for four five-year intervals to 1987 are estimated using a computerized system based on an inversion of an input-output model interacting with social and environmental indicator connectives.

PB-242 300/2 **PC A08/MF A01**
 Rocketdyne, Canoga Park, Calif.
Urban Water Development and Management in Arid Environments. Volume I: Completion Report
 Walter Unterberg, Anthony L. Midnling, John A. Dracup, Jonathan W. Bulkey, and Gary L. Widman. 31 Mar 75, 169p* R-9625-1, OWRT-C-1734(3395)(1)
 Contract DI-14-31-0001-3393, DI-14-31-0001-9000
 See also PB-242 301.

Descriptors: *Water management, *Urban planning, *Arid land, *Semiarid land, Water resources, Decision making, Mathematical models, Political objectives, Water law, Interviews, Management games, Gaming models, Computers programming, Arizona, California, Nevada, New Mexico, Utah.
 Identifiers: Las Vegas(Nevada), Oxnard(California), Salt Lake City(Utah), San Bernardino(California), San Diego(California), Tucson(Arizona), Carson City(Nevada), Goleta County(California), Alamogordo(New Mexico).

In Phase I (Project C-1734), an appraisal was made of urban water development and management in arid and semiarid environments by means of case studies of key historic water decisions in six cities. In each city alternative solutions to water resource problems and organizations and factors that affected the decisions were identified and re-

searched through interviews. These data were inputs to a Political Interaction Simulation computer program (PISP), which was used to model the decision-making processes. The results of the case studies led to guidelines that were applied during Phase II in three arid and semiarid cities having to make key water decisions in the near future. This included the use of PISP as a predictive decision-making tool, validated by election results, and the development of a Gaming Simulation tool entitled 'The Water Game', as a strategic arid urban water resources planning tool. Portions of this document are not fully legible.

PB-242 301/0 **PC A07/MF A01**
 Rocketdyne, Canoga Park, Calif.
Urban Water Development and Management in Arid Environments. Volume II: The Water Game—Gaming Simulation for Urban Water Resources Planning
 Walter Unterberg, John A. Dracup, William J. Trott, and Michael E. Mulvihill. 31 Mar 75, 145p* R-9625-2, OWRT-C-1734(3395)(1)
 Contract DI-14-31-0001-3393, DI-14-31-0001-9000
 See also Volume 1, PB-242 300.

Descriptors: *Water management, *Urban planning, *Arid land, *Semiarid land, Water resources, Decision making, Mathematical models, Political objectives, Water law, Computerized simulation, FORTRAN, Management games, Computer programs, Arizona, California, Nevada, New Mexico, Utah.
 Identifiers: Las Vegas(Nevada), Oxnard(California), Salt Lake City(Utah), San Bernardino(California), San Diego(California), Tucson(Arizona), Carson City(Nevada), Goleta County(California), Alamogordo(New Mexico), FORTRAN 4 programming language.

Volume 2 deals with the generation and practice of The Water Game, a Gaming Simulation for Urban Water Resources Planning. Part 1, 'Game Description' deals with the development and detailed features of The Water Game. It includes the documentation and listing of the digital computer program that forms part of the gaming simulation. Part 2 constitutes the 'Players' Manual,' which is the actual document used by the participants during the playing of the game.

PB-242 405/9 **PC A03/MF A01**
 Massachusetts Inst. of Tech., Cambridge.
Proceedings of the M.I.T. Symposium on Strategies for A.I.D. Programs in Selected Areas of Science and Technology. Volume 4. Food Technology
 J. P. Ruina. Apr 74, 31p
 Contract AID/ta-1067
 Report on Technology Adaptation Program. See also Volume 3, PB-242 404.

Descriptors: *Technology utilization, *Food industry, *Meetings, Developing countries, Nutrition, Technology transfer, Fermentation, Feeding stuffs, Econometrics, Proteins, Nutritional deficiency diseases.
 Identifiers: Single cell proteins, Malnutrition.

The subject matter involves the processing, preservation and manufacture of foods. In the context of technology transfer from industrialized countries to low-income countries, one might formulate two basic objectives: The first is to increase food supply, or more accurately, the supply of certain nutrients to populations. A second objective is the combatting of malnutrition.

PB-242 973/6 **PC A02/MF A01**
 North Central Forest Experiment Station, St. Paul, Minn.
How Craftsmen and Home Hobbyists Can Make and Use Wood Plastic Composite Materials
 Forest service general technical rept. (Final)
 Howard N. Rosen. Jan 74, 13p* Rept no. FS-GTR-NC-10

Descriptors: *Wood based composites, *Plastics, *Handicrafts, Gluing, Woodworking, Impregnating, Wood processing industry, Curing, Equipment,

Wood finishing, Safety, Machining, Workshops, Efficiency.
 Identifiers: Hobbyists.

A technique for producing craft items of wood-plastic composites in the home, school, or small shop is described. Suggestions are given on how to build the treating equipment for under \$30. Wood impregnation, processing techniques, gluing, finishing, and safety are discussed. The ease and versatility of producing crafts from wood-plastic composites are demonstrated by example projects.

PB-243 409/0 **PC A03/MF A01**
 Washington Univ., St. Louis, Mo. Center for the Biology of Natural Systems.
Agricultural Resources Consumed in Beef Production
 William Lockeretz. Jun 75, 48p* Rept no. CBNS-AE-3
 Grant NSF-GI-043890

Descriptors: *Beef, *Irrigation, *Fertilizers, *Feeding stuffs, Farm crops, Water supply, Production, Food consumption, Natural resources, Arid land, Forage grasses, Proteins, Food supply, Wheat plants, Soybean plants, Correlation techniques.

The consumption of energy, fertilizer, water, and cropland has been calculated for nine different beef production systems. These systems vary with respect to region, type of pasture and cropland, and feeding program. Among the nine systems, there is a considerable range of resource intensiveness, depending on factors such as type of pasture, type of cropland (irrigated vs. dryland) and kinds of roughages and protein supplements. Data are also presented on the consumption of the same resources in the production of wheat and soybeans in the same regions, on comparable land to that used to raise cattle feeds. In all cases, the resource consumption for beef is very much greater than for a wheat/soybean mixture of equivalent protein value.

PB-243 470/2 **PC A13/MF A01**
 Hawaii State Advisory Task Force on Energy Policy, Honolulu.
Alternate Energy Sources for Hawaii
 Report of the Committee.
 Feb 75, 276p NSF/RA/G-75/003
 Grant NSF-ISR71-03844-A03
 Prepared in cooperation with Hawaii State Dept. of Planning and Economic Development, Honolulu, and Hawaii Natural Energy Inst., Honolulu.

Descriptors: *Energy sources, *Hawaii, *Energy conversion, Waste disposal, Plants(Botany), Hydroelectric power, Wind power, Nuclear power, Geothermal energy conversion, Solar energy conversion, Solar sea power plants, Waterwave energy conversion, Coal, Energy storage, Environmental impacts, Economics, Energy policy.
 Identifiers: Solid wastes.

This is a report of the Committee on Alternate Energy Sources for Hawaii, which was established by the Governor's State Advisory Task Force on Energy Policy to help respond to problems created by the Arab oil embargo. Fourteen studies were undertaken -- ten on alternate energy sources, and four more general studies. Included as appendices to the report are all the studies on the potential of different energy sources to minimize the State's near-total dependence on seaborne petroleum. These alternate sources of energy are: solid waste; bioconversion; hydroelectric; wind; geothermal; solar collectors; ocean thermal energy conversion; waves, tides, currents, osmosis; coal; nuclear.

PB-243 813/3 **PC A02/MF A01**
 Minnesota Univ., Minneapolis. Water Resources Research Center.
Proceedings of Public Workshop Conference on Water Resources Problems and Research Needs in Central Minnesota, Held at Minnesota Univ., Minneapolis on October, 1973
 Oct 73, 12p OWRT-A-028-MINN(6)
 Contract DI-14-31-0001-4023
 See also PB-237 500.

SELECTED APPROPRIATE TECHNOLOGIES

Descriptors: *Water resources, *Water management, *State planning, *Minnesota, Meetings, Workshops, National government, State government, Regional development, Local government, Research projects, Private initiative, Organizations, Interest groups, Universities, Research needs, Water pollution standards, Thermal pollution.

Identifiers: Priorities.

The Water Resources Research Center, University of Minnesota, is developing a long-range comprehensive plan for water resources research in Minnesota involving federal, state and local agencies, private organizations, consultants, University of Minnesota, state and private colleges, interest groups, and citizens. An attempt is being made to formulate broad research guidelines by inventorying research needs and assigning priorities. The object of this Workshop Conference was to identify research needs and priorities for central Minnesota.

PB-243 846/3 PC A06/MF A01
Fairleigh Dickinson Univ., Teaneck, N.J. Dept. of Economics.
Construction and Economic Development. A Case Study and International Comparisons of Productivity
Final rept.
Peter J. Cassimatis. Aug 75, 106p Rept no.
FDU/DE-75/01

Descriptors: *Economic development, *Developing countries, *Construction industry, Construction practices, Economic surveys, Greece, Technological advances, Econometrics, Economic models, Interindustry economics, Employment profiles, Earnings, Comparative studies, Productivity, Foreign countries, Demand(Economics), National economy.

The relationship of construction and aggregate economic activity is the subject of this study with particular emphasis on the role of the construction industry plays in the growth of a developing country (Greece). The report analyzes the demand characteristics of construction, based on econometric equations, interindustry relationships, employment and earnings. Calculations show the relative share of construction in the national economy and comparisons are made of construction productivity with other industries of the United States and 12 OECD countries.

PB-244 557/5 PC A15/MF A01
Midwest Research Inst., Kansas City, Mo.
Guidelines for the Disposal of Small Quantities of Unused Pesticides
Final rept.
Edward W. Lawless, Thomas L. Ferguson, and Alfred F. Meiners. Jun 75, 342p EPA/670/2-75/057
Contract EPA-68-01-0098
Errata sheet inserted.

Descriptors: *Solid waste disposal, *Pesticides, *Herbicides, *Insecticides, Manuals, Decontamination, Waste treatment, Incinerators, Neutralizing, Oxidation, Reduction(Chemistry), Degradation, Management planning, Classification, Toxicity, Water pollution control, Dust.
Identifiers: *Liquid waste disposal, Pesticide spills.

This study has compiled and organized information that will be useful to responsible authorities in advising the layman (particularly the homeowner and small farmer) how to dispose properly of small amounts of surplus and unwanted pesticides and pesticide containers, and in treating pesticide spills. The report brings together available information on pesticide disposal methods and on over 550 individual pesticides, and evaluates this information in terms of the experience and equipment that the average layman has. Fourteen pesticide disposal procedures are described and procedures for disposal of containers and cleanup and treatment of spills are included. Preferred and alternate disposal procedures are recommended for over 550 pesticides. The report includes a cross-index of over 1,600 pesticide names, tables showing the chemical composition and properties pertinent

to disposal of the selected pesticides and bibliography of 166 references.

PB-244 691/2 PC A05/MF A01
Oklahoma State Univ., Stillwater. Dept. of Agricultural Engineering.

Improved Design and Operating Criteria for Rural Water Districts

Completion rept.
James E. Garton. Jun 75, 77p OWRT-B-028-OKLA(2)

Descriptors: *Water consumption, *Rural areas, Design criteria, Water supply, Dairies, Industrial water, Demand(Economics), Pumping, Oklahoma.
Identifiers: *Water districts, Payne County(Oklahoma), Dairy industry.

Data were obtained on Rural Water District No. 3, Payne County, Oklahoma. There was a significantly different pattern of usage for three classes of customers. The average monthly usage per tap ranged from 8768 to 19183 gallons for dairies, 4357 to 11983 gallons for Class A taps, and 2537 to 4160 gallons for Class B taps. The average monthly usage per person ranged from 1424 to 2821 gallons for Class A taps and from 989 to 1664 gallons for Class B taps. Optimal design values for peak demand ranged from: 1.0 to 1.5 gallons per minute per tap; 1.3 to 1.8 gallons per minute per Class A tap; 0.6 to 0.9 gallons per minute per Class B tap; 0.6 to 0.8 gallons per minute per person; 0.5 to 0.7 gallons per minute per person, Class A tap; and 0.3 to 0.6 gallons per minute per person, Class B tap. The optimal period off-peak pumping time is from 10 p.m. to 7 a.m., a period of 9 hours.

PB-244 696/1 PC A02/MF A01
Arizona Univ., Tucson. School of Renewable Natural Resources.

Development of a Bibliographic Information System for Water Yield Improvement Practices
Project completion rept. Jul 72-Jun 75
Linda M. White, David B. Thorud, and Peter F. Ffolliott. Aug 75, 11p OWRT-A-042-ARIZ(9)
Contract DI-14-31-0001-3803

Descriptors: *Water supply, *Water management, *Bibliographies, Information retrieval, Watersheds, Forest land, Land use, Vegetation, Arid land, Evapotranspiration, Wildlife, Environmental impacts, Arizona.
Identifiers: *Water yield.

Development of the Watershed Management Information System (WAMIS) began in 1972. WAMIS is designed to serve a variety of users who are interested in water and natural resource research in Arizona. WAMIS is a computerized bibliographic reference retrieval system which provides literature searches for users, in the form of individualized computer printouts of citations and abstracts, based upon a user's special interests. The literature covered in WAMIS includes effects of land management practices and vegetation management on water and other related resources, such as forage production, wildlife habitat, timber production, and recreational use. Research done in Arizona has been emphasized. General procedures used in banking and retrieval are described. Types of search requests have varied, including topics such as wildlife use of ponderosa pine forests, environmental and vegetation effects on evapotranspiration, hydrologic modeling, Arizona water quality data, the effect of timber cutting practices on runoff, and revegetation of treated pinyon-juniper vegetation.

PB-244 880/1 PC A03/MF A01
New Mexico State Univ., University Park. Water Resources Research Inst.

Utilization of Water in a Semi-Arid Region

Technical completion rept.
H. D. Fuhring. Sep 75, 40p WRRI-059, OWRT-B-029-N.-Mex.(1)

Descriptors: *Water consumption, *Farm crops, *Semi-arid land, *Dry farming, Water conservation, Evapotranspiration, Surface water runoff, Grain sorghum plants, Nitrogen, Moisture, Field tests,

Tables(Data), New Mexico, Southern High Plains Region(New Mexico).

Identifiers: *Water utilization, Atrazine.

A five-year study in the Southern High Plains (annual rainfall of 16 inches) using combinations of bare micro-watershed and growing bed widths resulted in increased crop yields on the growing beds as the proportion of micro-watershed was increased. However, yields for the entire area (including both bed and shed) decreased. Limited work indicated the possibility of also cropping the shed areas and it was concluded that this would be a more practical way of utilizing micro-watersheds. Grain sorghum and sunflowers were successful dryland crops on both beds and sheds while wheat was more suitable as a crop on the sheds rather than on the beds. The use of an antitranspirant (atrazine) gave promising results on grain sorghum but further work is needed.

PB-245 004/7 PC A02/MF A01
Department of Transportation, Washington, D.C. Office of the Assistant Secretary for Policy and International Affairs.

Suggestions for Temporary Erosion and Siltation Control Measures. (Erosion Y Sedimentacion: Medidas Temporarias De Control)
1975, 24p
Text in Spanish.

Descriptors: *Erosion control, *Sedimentation, *Highways, *Developing countries, Slopes, Construction, Manuals, Soil erosion, Diagrams, Efficiency, Latin America.

The manual was prepared as an aid to field personnel engaged in the construction of highways in Latin America. It provides suggestions on the most efficient ways of providing emergency care against erosion and sedimentation by prompt treatment of the slopes. The booklet contains 24 pages of diagrams of various types of problems and methods of controlling them. The report was designed for distribution to the governments of Latin American countries through the cooperation of the Agency for International Development.

PB-245 128/4 PC A03/MF A01
California Univ., San Diego, La Jolla.

Proceedings of Conference on Enzyme Engineering as Related to Food and Energy Production, Held at the University of California, San Diego, on 22-25 July, 1974

William D. McElroy. 1974, 27p NSF/RA/T-74-012

Descriptors: *Enzymes, *Energy sources, *Food, Meetings, Manufactured gas, Methane, Photosynthesis, Water, Hydrogen, Biochemical fuel cells, Cellulose, Decomposition, Agricultural wastes, Nitrogen fixation.

Identifiers: *Enzyme technology, *Immobilized enzymes.

The report presents the conference's recommendations and summary background information for further research on enzyme engineering as related to food and energy production. Primary emphasis is in generation of methane, biophotolysis of water, efficient utilization of cellulose, biochemical fuel cells, nitrogen fixation, and the purification and stabilization of enzymes and enzyme systems.

PB-245 259/7 PC A07/MF A01
Colorado State Univ., Fort Collins. Environmental Resources Center.

Individual Home Wastewater Characterization and Treatment

Completion rept.

Edwin R. Bennett, and K. Daniel Linstedt. Jul 75, 148p Completion-66, W75-11852
Contract DI-14-31-0001-5006

Prepared in cooperation with Colorado Univ., Boulder. Dept. of Civil and Environmental Engineering.

Descriptors: *Sewage treatment, *Waste water reuse, *Rural areas, Septic tanks, Mountains, Aerobic processes, Residential buildings, Colorado.

Identifiers: *Domestic wastes.

SELECTED APPROPRIATE TECHNOLOGIES

Disposal of wastewater from isolated homes in mountain and rural locations in Colorado presents unique and difficult problems. The purpose of the study was to evaluate the flow and pollution patterns from individual homes and to evaluate existing and potential treatment methods. Field evaluation of home wastewater flow and pollutant characteristics was accomplished. Data for individual fixtures and appliances were obtained with measurement of many pollutant parameters. A brief evaluation of the home treatment methods was accomplished.

PB-245 326/4 PC A06/MF A01
Illinois Univ. at Urbana-Champaign. Center for Advanced Computation.

The Feasibility of Coal Mine Cooperatives: A Preliminary Report and Analysis
Michael Rieber, and Shah Lee Soo. Apr 75, 122p
Also pub. as Federal Energy Administration, Washington, D.C. Office of Coal, FEA/G-75/581.

Descriptors: *Commodity management, *Coal mining, Cooperation, Coal preparation, Coal handling, Transportation, Coal, Management, Coordination, Marketing, Feasibility, Mining equipment.
Identifiers: *Cooperative enterprises.

The report is a preliminary analysis on the feasibility of marketing/transportation cooperatives composed of small producing coal mines; that is, mines producing between 100,000 - 500,000 tons of coal per year. The report is composed of 9 sections: Sections I, II, III cover Project Parameters, Summary and Review and Legal Aspects of Coal Cooperatives Footnotes to Section III, Section IV, Potential Cooperative Identification defines small producing coal mines as primarily located in Alabama, Kentucky, Ohio, Western Pennsylvania, Tennessee, Virginia and West Virginia. Section V, Coal Quality Control, discusses the different coal seams mined by small mines in these areas. Section VI, Coal Preparation, is an analysis of the type of machinery used in mining coal: in screening and picking, crushing, washing, drying dust removal, blending, and size and complexity of plants. Section VII, Transportation, discusses train, truck, belt conveyor and pneumatic pipelines as a means of transport from the mine to the railhead or preparation plant. Section VIII, Transportation: Unit Trains, discusses loading facilities for unit trains. Section IX discusses facilities.

PB-245 593/9 PC A07/MF A01
National Academy of Sciences, Washington, D.C.
Arid Lands of Sub-Saharan Africa
Staff progress rept. Sep 73-Jun 74.
1975, 128p*
Contract AID/csd-2584
See also PB-245 594.

Descriptors: *Arid land, *Developing countries, *Foreign aid, *Africa, Droughts, Project planning, Natural resources, Management planning, International relations, Organizations, Meetings.
Identifiers: *SubSaharan Africa.

The Advisory Panel on Arid Lands of Sub-Saharan Africa of the Board of Science and Technology for International Development (BOSTIA) was appointed by NAS in late 1973 in response to a request from AID. The general purpose of the panel was to advise AID on problems of the drought-stricken region of West Africa, and to provide assistance in the design and implementation of U.S. participation in an international, collaborative, scientific effort currently being organized to address the emergency situation.

PB-245 594/7 PC A03/MF A01
National Academy of Sciences, Washington, D.C.
Arid Lands of Sub-Saharan Africa
Staff final rept. Jul-Dec 74.
1975, 50p*
Contract AID/csd-2584
See also PB-245 593, and PB-245 595.

Descriptors: *Arid land, *Developing countries, *Foreign aid, *Africa, Organizations, Meetings, Droughts, Project planning, Environments, Ecology, Climatology, Production planning, International relations.

Identifiers: *SubSaharan Africa.

A report is made by the NAS Advisory Panel on Arid Lands of Sub-Saharan Africa which deals with problems of the long-term development of the Sahel.

PB-245 595/4 PC A13/MF A01
National Academy of Sciences, Washington, D.C.
Arid Lands of Sub-Saharan Africa
Staff final rept.
1975, 286p*
Contract AID/csd-2584
See also PB-245 594.

Descriptors: *Arid land, *Developing countries, *Foreign aid, *Africa, Meetings, Chad, Mali, Mauritania, Niger, Senegal, Upper Volta, Communications management, Land development, Agriculture, Livestock, Climatology, Transportation, Industries, Sociometrics, Health.
Identifiers: *SubSaharan Africa, Sahel(Africa).

A report is made on a 1974 conference on development problems in the Sahel, in Bellagio, Italy. The report is based on analysis and integration of ideas from a large number of proposals for development and aid to the nations of the Sahel. A survey and a critique are made of plans for development in the following areas: communication, transportation, dryland crop production, irrigated crop production, livestock and range production, technological and industrial developments, socio-cultural and health developments, and institutional, policy, and economic structural development.

PB-246 035/0 PC A09/MF A01
Federal Trade Commission, Washington, D.C.
Bureau of Competition.
Staff Report to the Federal Trade Commission on Agricultural Cooperatives
Frank Lipson, and Clint Batterton. Sep 75, 198p*
Rept no. FTC-1030-X1030

Descriptors: *Organizations, *Agriculture, *Marketing, *Government policies, Economic impact, Surveys, Inequalities, Analyzing, Commerce, Prices, Barriers, Recommendations.
Identifiers: *Cooperatives, Antitrust laws, Exemptions, Restraint of trade.

This report is intended as an analysis of the agricultural cooperative antitrust exemption, agricultural 'marketing order' programs, and several collateral issues relating thereto. The report should not be construed as implying that any agricultural cooperatives are or might be violating the antitrust laws or that the Bureau of Competition or the Commission will undertake law enforcement initiatives with regard to any issues discussed. The report is intended as a contribution to the understanding of issues which underlie the creation and later application of the cooperative and marketing order concepts.

PB-246 392/5 PC A04/MF A01
Colorado State Univ., Fort Collins. Inst. of Rural Environmental Health.
A Study of Mosquito Prevention and Control Problems Associated with Stream Modification Projects
Final rept.
John R. Bagby. Oct 74, 57p*

Descriptors: *Mosquitoes, *Pest control, *Streams, Water resources, Design, Breeding, Swamps, Channel improvements, Site surveys, Disease vectors, Public health, Insect control.

Recognizing the threat to public health by mosquitoes and other arthropods this study provides methods and techniques that can be utilized in planning and design for modification of streams to reduce or eliminate the breeding areas.

PB-247 079/7 PC A02/MF A01
Research Triangle Inst., Research Triangle Park, N.C.
RANN Utilization Experience. Case Study No. 16. Transportable Solar Laboratory
R. LeChevalier. 1975, 25p NSF/RA/G-75-044

Grant NSF-C927

Also included in complete report and summary, PB-247 243. PC\$13.00, MF\$2.25. Prepared in cooperation with Honeywell, Inc., Minneapolis, Minn. Systems and Research Center.

Descriptors: *Technology transfer, *Solar energy conversion, *Solar space heating, Solar air conditioning, Laboratories, Test facilities.
Identifiers: Transportable Solar Laboratory project.

The primary objectives of the Transportable Solar Laboratory (TSL) project are to collect data on the performance of a solar energy conversion system, to test that system and its components in actual operation, and to communicate the potential of solar energy conversion systems to community leaders in education, engineering, science, government, and industry. The report briefly discusses use of the TSL.

PB-247 098/7 PC A21/MF A01
Office of Water Research and Technology, Washington, D.C. Water Resources Scientific Information Center.
A Selected Annotated Bibliography on the Analysis of Water Resource Systems. Volume 6
Daniel P. Loucks. Sep 75, 484p* Rept nos. OWRT/WRSIC-75-201, W76-01517
See also PB-235 336.

Descriptors: *Water resources, *Systems analysis, *Bibliographies, Abstracts, Optimization, Mathematical models, Urban areas, Waste water, Irrigation, Salinity, Management, Arid land, River basin development, Operations research, Indexes(Documentation), Water supply.

The report is an annotated bibliography consisting of 301 abstracts of selected publications issued in 1973 and 1974 pertaining to the application of systems analysis techniques for defining and evaluating alternative solutions to water resource problems. The first two volumes of the bibliography, having the same title, were published by the Cornell University Water Resources and Marine Sciences Center, Ithaca, New York (Publication 25, August 1969; Publication 35, June 1971); the third, fourth, and fifth volumes were published by the Water Resources Scientific Information Center in December 1972, December 1973, and July 1974, respectively. Both subject and author indexes are provided. Descriptors are listed with each abstract. The abstracted material emphasizes the application of optimization and simulation techniques for assisting the planning and management of water resource systems.

PB-247 182/9 PC A04/MF A01
Woods Hole Oceanographic Institution, Mass.
Preliminary Results with a Pilot Plant Waste Recycling Marine-Aquaculture System
Technical rept.
John H. Ryther. Sep 75, 61p WHOI-75-41, NOAA-75103103
Grant NOAA-04-4-158-5, NSF-GI-43884
Sponsored in part by Grant NOAA-04-5-158-8.

Descriptors: *Sewage treatment, *Waste water reuse, *Aquaculture, *Algae, Shellfish, Oysters, Lobsters, Flatfishes, Sea grasses, Nitrogen, Tropical regions, Feeding stuffs, Marine fishes, Diatoms, Field tests, Pilot plants.
Identifiers: Sea Grant program.

A combined waste recycling-marine aquaculture system capable of complete nitrogen removal from treated domestic wastewater has been developed and tested on a pilot-plant scale over a one-year period. Effluent from secondary sewage treatment, mixed with seawater, is used to grow unicellular marine algae in large, continuous-flow, outdoor mass cultures. Harvest from the algae cultures is fed to oysters and other filter-feeding bivalve molluscs and to secondary crops of flounders or lobsters. Dissolved wastes produced by the animals are assimilated by cultures of commercially-valuable seaweeds. Successful cultures of unicellular algae, mostly diatoms, and seaweeds have been sustained over long periods of time (months) with only minor problems. Bivalve mollusc culture was unsuccessful during the first year of operation. An

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alternative nitrogen-removal system consisting only of seaweeds fed a continuous flow of secondary sewage effluent mixed with seawater has also been evaluated. Year-round operation would be possible in tropical to semi-tropical climates. In temperate climates, operation of the system is possible only on a seasonal basis.

PB-247 260/3 PC A03/MF A01
Research Triangle Inst., Research Triangle Park, N.C.
RANN Utilization Experience. Case Study No. 17. Solar School Projects

P. Lawless. 1975, 26p NSF/RA/G-75-045

Grant NSF-C927

Also included in complete report and summary, PB-247 243. PCS\$13.00, MF\$2.25. Prepared in cooperation with AAI Corp., Baltimore, Md., Inter-Technology Corp., Warrenton, Va., and General Electric Co., Philadelphia, Pa. Space Div.

Descriptors: *Technology transfer, *Solar space heating, *Solar energy conversion, Schools, School buildings.

In response to the energy crisis of 1973-74, NSF-RANN funded proof-of-concept experiments involving the use of solar energy to supply part of the heating required in four public schools. The purpose of the experiments was to demonstrate that solar heating is a technologically viable option in response to the shortage of fossil fuels. The report briefly reviews results of the experiments.

PB-247 261/1 PC A02/MF A01
Research Triangle Inst., Research Triangle Park, N.C.

RANN Utilization Experience. Case Study No. 18. Management of Heat Rejected from Power Plants

G. J. Trezek, and V. E. Schrock. 1975, 21p NSF/RA/G-75-046

Grant NSF-C927

Also included in complete report and summary, PB-247 243. PCS\$13.00, MF\$2.25. Prepared in cooperation with California Univ., Berkeley.

Descriptors: *Technology transfer, Electric power plants, Heat transfer, Water cooling, Water towers, Lagoons(Ponds), Disposal, Management, Energy conservation.

Identifiers: *Waste heat utilization.

This report briefly discusses various methods for waste heat disposal and minimization of the consequent effects of this disposal on the environment. Conservation of thermal energy is also of interest.

PB-247 429/4 PC A06/MF A01
Smithsonian Institution, Washington, D.C. Office of International and Environmental Programs.

The Environmental Impact of Rapid Urbanization: Guidelines for Policy and Planning. Based Upon a Case Study of Seoul, Korea, in 1972- and 1973

Peter H. Freeman. 1974, 103p
Contract AID/csd-2608

Descriptors: *Urban planning, *Developing countries, *Environments, Urbanization, Municipalities, Korea, Guidelines, Government policies, Local government, Handbooks, Air pollution, Environmental surveys, Waste disposal, Water pollution, Monitoring.

Identifiers: *Seoul(Korea), Squatter communities.

Guidelines for preserving the environments of rapidly growing cities in developing countries are clearly needed. This document attempts to set forth such guidelines based largely on a case study of Seoul, Korea, as well as relevant examples from other large cities in the developing world. The guidelines are especially directed to cities whose urbanization has not advanced to the point that major decisions have already been made on large-scale infrastructural technologies, whose physical plans are still tentative and flexible, and whose slums or squatter settlements have not yet created the need to take emergency or remedial measures.

PB-247 430/2 PC A05/MF A01
Smithsonian Institution, Washington, D.C. Office of International and Environmental Programs.
The Environmental Impact of a Large Tropical Reservoir: Guidelines for Policy and Planning. Based Upon a Case Study of Lake Volta, Ghana, in 1973 and 1974

Peter H. Freeman. 1974, 97p

Contract AID/csd-2608

Descriptors: *Dams, *Lakes, *Tropical regions, *Developing countries, Ecology, Monitors, Environmental impacts, Inventories, Surveys, Volta Lake, Ghana.

The report summarizes all possible ecological and related physical environmental impacts of tropical dams and man-made lakes within a framework suited to the needs of the impact-assessment procedure. On the basis of the Volta Lake case study and other published experience, a brief narrative of likely impacts is presented. This is followed by key questions that should be asked to determine impacts. Data requirements and alternative methodologies (e.g., research, survey, inventory, evaluation, monitoring) are given to assist in the design of the assessment study.

PB-247 431/0 PC A07/MF A01
Smithsonian Institution, Washington, D.C. Office of International and Environmental Programs.

Coastal Zone Pollution by Oil and Other Contaminants: Guidelines for Policy, Assessment and Monitoring in Tropical Regions. Based Upon a Case Study in Indonesia, in 1973

Peter H. Freeman. 1974, 144p

Contract AID/csd-2608

Descriptors: *Oil pollution, *Coasts, *Tropical regions, *Developing countries, Policies, Recommendations, Monitors, Bibliographies, Ecology, Prevention, Marine biology, Indonesia.

The report provides guidelines useful to tropical nations for the prevention and control of pollution of coastal waters by oil and other contaminants. It reviews the state of knowledge on the effects of pollution by oil in warm tropical waters, sets forth information needed for determining policies for controlling coastal zone pollution by oil, outlines several policy options and their implications and presents recommendations for monitoring coastal pollution. Included in the report is an Annotated Bibliography on the Biological and Ecological Effects of Oil Pollution in Tropical Waters.

PB-247 819/6 PC A05/MF A01
International Rice Research Inst., Los Baños, Laguna (Philippines). Agricultural Engineering Dept.

Agricultural Machinery Development Program
Terminal rept. 1965-74.

21 May 75, 97p

Contract AID/csd-834, AID/csd-2541

Descriptors: *Agricultural machinery, *Developing countries, Cost engineering, Power supplies, Rice plants, Farm processing, Production, Farm crops, Economic factors, Tractors, Experimental design, Cultivation, Plows, Agronomy, Harvesters, Philippines, Asia.

The program provided a sharper focus on the development and commercialization of appropriate rice production and processing machines in the developing countries. The main objective of the USAID/IRRI program was to provide simple agricultural equipment for small farms which could be manufactured by local metalworking firms in the developing countries. The program activities were divided in three major areas: (1) machinery design, (2) test and evaluation, and (3) economics of mechanization.

PB-248 043/2 PC A09/MF A01
Denver Research Inst., Colo.

The Industrial Research Institute in a Developing Country: A Comparative Analysis

James P. Blackledge. 31 Aug 75, 191p
Contract AID/csd-3316

Descriptors: *Industrial engineering, *Developing countries, *Research management, Organizations, Technology transfer, Information systems, Services, Corporations, Banking business, Foreign government, Constraints, Industrial training, Project planning, Objectives, Universities, Financing. Identifiers: Entrepreneurship, Institutes.

The objectives of the study have been to: Analyze a variety of approaches to industrial research which have been tried; identify those factors which have contributed to or inhibited effective coupling of industrial research institutes with industry and developmental interests; differentiate between those types of constraints to development of viable institutes which are country specific and those common problems which have limited the value of these institutes regardless of their geographical location.

PB-248 073/9 PC A03/MF A01
Montana State Univ., Bozeman. Water Resources Research Center.

Ground Water Seepage and Its Effects on Saline Soils

Research rept.

Loren L. Bahls, and Marvin R. Miller. Oct 75, 45p
MUJWRRC-66, OWRT-A-049-MONT(1)

Descriptors: *Ground water, *Saline soils, *Water pollution, *Seepage, Farm crops, Grasses, Arid land, Water conservation, Soil water, Water pollution control, Hydrogeology, Environmental impacts, Montana.

Identifiers: Northern Great Plains Region(United States), Saline seeps.

Saline seeps are recently developed saline soils in non-irrigated areas that are wet some or all of the time, often with white salt crusts, and where crop or grass production is reduced or eliminated. They are manifestations of 20th century dryland agriculture and the crop-fallow rotation system necessary for moisture conservation and small grain production on the scale practiced in Montana. The wide spread occurrence and rapid growth of saline seeps has been recognized as one of the most serious conservation problems in the Northern Great Plains. The report outlines the history of the development of saline seep in Montana and efforts to control it; it describes in detail the hydrogeological setting of the area affected and notes the potential for spreading throughout much of the Northern Great Plains. Environmental aspects and implications of saline seep, including environmental impact and possible control technologies are discussed.

PB-248 257/8 PC A04/MF A01
National Academy of Sciences, Washington, D.C. Committee on World Food, Health and Population.

Population and Food. Crucial Issues

Final rept.

Sep 75, 60p*

Contract NSF-C310

Descriptors: *Food, *Populations, Food supply, Agriculture, Nutrition, Population growth, Food storage, Foreign aid, Developing countries, International relations, Natural resources, Health, Nutritional deficiency diseases.

The report examines those elements that act as constraints on providing an adequate food supply to the world's peoples, and certain ameliorative measures that might be taken to relieve those constraints. The report deals, in turn, with population; food and health; agricultural resources; factors such as affluence, climate, and aid programs; means to increase food supplies; and certain research priorities. It concludes with five general recommendations.

PB-248 297/4 PC A09/MF A01
North Carolina Water Resources Research Inst., Raleigh.

Water Supply and Wastewater in Coastal Areas: Proceedings of Southeastern Conference Held on April 2-4, 1975

James M. Stewart. 1975, 194p* NOAA-75120106
Also pub. as North Carolina Univ. Sea Grant reprint no. 83. Sponsored in part by Coastal Plains Center

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for Marine Development Services, Washington, D.C.

Descriptors: *Water supply, *Water pollution, *Coasts, *Meetings, *Regional planning, Waste water, Reviews, Water quality management, Sewage disposal, Technology assessment, Land use zoning, Environmental impacts, Population growth, Economic development, Public health, Social welfare, Water resources, Sanitary engineering, Project planning, Ocean environments, Financing.
Identifiers: Sea Grant program, *Environmental protection.

The article details the proceedings of the southeastern conference on Water Supply and Wastewater in Coastal Areas. The Conference was conducted to review the state of the art of proper planning and management of water supply and wastewater disposal in coastal areas. Special attention was paid to defining technological and institutional alternatives, their relation to land use planning and environmental protection, and to identifying those water and wastewater problems of significance in coastal areas. A major problem that was discussed at the conference is associated with increasing population growth and economic development in these areas is the provision of safe and adequate water supplies and management of wastewater discharges in a manner consistent with public health and welfare and environmental protection. Both the presentations and discussion sessions are included in the report.

PB-248 338/6 PC A13/MF A01
Georgia Inst. of Tech., Atlanta. Engineering Experimentation Station.

Proceedings of the Conference and Seminar on Techniques and Methodologies for Stimulating Small-Scale Labor-Intensive Industries In Developing Countries, held at Atlanta, Georgia, on March 10-14, 1975

Donald E. Lodge, and Kay Ellen Auciello. Sep 75, 295p
Contract AID/CM/ta-G-73-18
See also PB-248 339.

Descriptors: *Developing countries, *Economic development, *Industries, Meetings, Technology, Methodology, Stimulation, Information services, Coordination, Project planning, Organizations, Projects, Businesses, Operations, Industrial relations.
Identifiers: Small businesses, Case histories.

The principal goals of the conference were: -- To identify, analyze, and compare existing methodologies designed to stimulate small-scale industry; -- to disseminate knowledge about operational and linkage efforts; -- to establish the necessary links for coordination of future efforts of both the organizations in the developing countries and international development organizations, and -- to establish adequate feedback mechanisms for the present and future in order to enhance the design and utilization of the small industry program.

PB-248 339/4 PC A02/MF A01
Georgia Inst. of Tech., Atlanta. Engineering Experimentation Station.

Summary of the Conference and Seminar on Techniques and Methodologies for Stimulating Small-Scale Labor-Intensive Industries In Developing Countries, held at Atlanta, Georgia, on March 10-14, 1975

Summary rept.
Donald E. Lodge, and Kay Ellen Auciello. Sep 75, 25p*
Contract AID/CM/ta-G-73-18
See also PB-248 338.

Descriptors: *Developing countries, *Industries, *Meetings, Economic development, Stimulation, Technology, Methodology, Information systems, Projects, Surveys, Coordination, Planning, Businesses, Industrial relations, Operations.
Identifiers: Case histories.

The proceedings contain the addresses, papers and reports presented at the meeting, as well as discussion sessions. Conference and Seminar programs, a list of attendees and photographs are included. The conference was designed to present

information on successful contemporary programs for the stimulation of small-scale industries in developing countries.

PB-248 347/7 PC A03/MF A01
Georgia Inst. of Tech., Atlanta.
Employment Generation Through Stimulation of Small Industries. Guide to International Statistical Sources and National Development Plans at the International Development Data Center
Oct 74, 41p
Contract AID/csd-3175
See also PB-248 346, and PB-248 348.

Descriptors: *Economic development, *Developing countries, *Information systems, Statistical data, Indexes(Documentation), Documents, Classifications, Subject indexing, International relations, Sources, Planning, Bibliographies.
Identifiers: Foreign countries, Georgia Institute of Technology.

The Guide Development Plans at the International Development Data Center provides an index to and brief descriptions of specific statistical sources at IDDC concerning the countries of the Georgia Tech 211(d) counterpart organizations, a project funded by the U.S. Agency for International Development. It should be a useful starting point for researchers seeking such information. The Guide is the result of an inventory of publications to determine gaps in the collection of the International Development Data Center (IDDC). The results provide two major benefits. The first is the development of a guide to the present statistical resources in the IDDC collection. The second is the creation of a checklist for future acquisitions in areas where gaps are apparent.

PB-248 348/5 PC A03/MF A01
Georgia Inst. of Tech., Atlanta.
Employment Generation Through Stimulation of Small Industries
Annual rept. no. 1, 23 Feb 73-22 Feb 74.
22 Mar 74, 50p
Contract AID/csd-3175
See also Annual rept. no. 2, PB-248 349, and PB-248 347.

Descriptors: *Employment, *Developing countries, *Industrial relations, Project, Universities, International relations, Organizations, Cooperation, United States, Asia, Africa, South America, Communicating, Economic development, Objectives, Grants, Financing, Industries, Businesses.
Identifiers: Small businesses, Georgia Institute of Technology.

The primary objective of this program is to strengthen Georgia Tech's demonstrated capability in employment generation through the expansion of the small industry sector. A major effort was made to seek out, establish, and maintain counterpart and communications networks. To this end, formal agreements to work cooperatively on programs of mutual interest were signed between Georgia Tech, five counterparts in Asia, Africa, and South America. It is intended that these counterpart organizations will provide data and a real-world laboratory for testing and validating industrialization methodologies, relevant training programs, applied small industry research, and the like.

PB-248 349/3 PC A05/MF A01
Georgia Inst. of Tech., Atlanta.
Employment Generation Through Stimulation of Small Industries
Annual rept. no. 2, 23 Feb 74-22 Feb 75.
Feb 75, 98p
Contract AID/csd-3175
See also Annual rept. no. 1, PB-248 348.

Descriptors: *Employment, *Developing countries, *Industrial relations, Projects, International relations, Universities, Education, Economic development, Unemployment, Population migrations, Rural areas, Urban areas, Communicating, Management planning, Grants, Objectives, Industries, Businesses.

Identifiers: Small businesses, Georgia Institute of Technology, Rural to urban migration, Foreign countries.

The primary objective of this two-year-old program is to strengthen Georgia Tech's demonstrated capability in employment generation through the expansion of the small industry sector. This capability is particularly relevant to massive unemployment and rural-to-urban migration problems in many developing countries. The program is integral to the institutional commitment to international education and development.

PB-248 523/3 PC A23/MF A01
Mitre Corp., McLean, Va.
Impact of Hydrologic Modifications on Water Quality
Environmental protection technology series (Final)
Joginder Bhutani, Richard Holberger, Peter Spewak, Willis E. Jacobsen, and J. Bruce Truett. Apr 75, 543p* MTR-6887, EPA/600/2-75/007 Grant EPA-R-802310

Descriptors: *Sedimentation, *Dredging, *Construction, *Water quality management, *Water pollution, Surface waters, Hydrology, Dams, Channel improvements, Highways, Erosion control, Surface water runoff, Measurement, Soil erosion, Environmental impacts, Urban areas, Rural areas, Predictions.

The report describes the scope and magnitude of water pollution problems caused by hydrologic modifications (dams, impoundments, channelization, in-water construction, out-of-water construction, and dredging). Types of pollutants released by each class of hydrologic modification are identified, and quantitative estimates are made of the amount of the major pollutant-sediment--that enters the Nation's surface waters as a result of highway and urban construction. Methods for controlling the release of pollutants from hydrologic modification activities are described, and the effectiveness of sediment control measures is estimated. Two 'loading functions' are developed for predicting the quantities of sediment released from construction operations of given magnitude and location. These functions are based on measurements of sediment yields and other parameters at 10 construction sites. The accuracy and limitations of the functions are analyzed. Measurement data from all classes of hydrologic modifications are reported in the 42 case studies of field projects summarized in the appendices of the report.

PB-248 596/9 PC A18/MF A01
American Society of Civil Engineers, New York.
Proceedings of the Conference on Interdisciplinary Analysis of Water Resource Systems Held at Colorado University, Boulder, Colorado, on June 19-22, 1973
J. Ernest Flack. 1975, 410p OWRT-X-126(3757)(1)
Contract DI-14-31-0001-3757

Descriptors: *Water resources, *Water quality management, *Meetings, Systems engineering, Multiple purpose reservoirs, Africa, Limnology, Mathematical models, Great Lakes, Geotherapy, Economic development, Maline Creek, Civil engineering, Social welfare, Project planning, Law(Jurisprudence), Interactions, Decision making, Missouri, United States, California, Wisconsin River, Fraser River.
Identifiers: North Atlantic Region(United States), Saint Louis(Missouri), British Columbia.

The Water Resources Systems Committee of the American Society of Civil Engineers' Technical Council on Water Resources Planning and Management saw a critical need for developing an interdisciplinary approach to water resources development. This Conference was intended as an effective means of advancing the systems approach in this area. Formal papers on six interdisciplinary efforts were selected as case studies, around which discussions were built. These six papers include interdisciplinary studies on: (1) Large reservoirs in Africa; (2) limnological modeling of the Great Lakes; (3) geothermal development; (4) the North Atlantic Regional Water Resources Study;

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(5) Corps of Engineers planning experience in the St. Louis-Maline Creek; and (6) University research in the Wisconsin River and the Lower Fraser River (Brit. Columbia) water quality studies. Discussions are given after each paper. Included also is an introductory article on the interdisciplinary aspects of water resources planning and management.

PB-248 630/6 PC A16/MF A01
 Smithsonian Institution, Washington, D.C.
Environmental Aspects of a Large Tropical Reservoir - A Case Study of Volta Lake, Ghana
 Peter H. Freeman, Sep 74, 360p
 Contract AID/csd-2608
 Errata sheet inserted.

Descriptors: *Multiple purpose reservoirs, *Developing countries, *Volta Lake, *Environmental impacts, Economic development, Cost engineering, Project planning, Tropical regions, Power supplies, Rivers, Electric power plants, Surveys, Hydrogeology, Sewage treatment, Water supply, Food chains, Aquatic plants, Weed control, Sedimentation, Seismology, Water flow, Bathymetry, Mineral deposits, Salinity, Irrigation, Plankton, Fishes, Africa.
 Identifiers: *Ghana.

During 1973 the Smithsonian Institution's Office of International and Environmental Programs undertook a case study of the Volta Lake in Ghana. This was one of a series of case studies, carried out for the U.S. Agency for International Development, designed to better understand the environmental impacts of various development projects or situations. The purpose of these studies was to extract lessons which could be translated into guidelines to orient future development, in order to prevent costly and avoidable environmental impacts. The case study approach was chosen in view of the proven advantages of obtaining detailed understanding of a specific development. The Volta Lake was seen to constitute an excellent case study opportunity for a review of the environmental impacts of impounding a tropical river. Impacts in the impoundment area have been well researched and documented, and they are not dissimilar from the known impacts of other African man-made lakes. And like other hydropower schemes, the benefits have been very substantial.

PB-248 637/1 PC A03/MF A01
 Illinois Univ. at Urbana-Champaign. Dept. of Civil Engineering.
Concrete for Tunnel Liners: Mix Design Recommendations for Prototype Extruded Liner System
 Final rept. Aug 74-Aug 75
 Grant T. Halvorsen, Clyde E. Kesler, and Stanley L. Paul, Aug 75, 32p UILU-ENG-75-2010, FRA/ORD-75-89
 Contract DOT-FR-30022
 See also PB-248 636.

Descriptors: *Reinforced concrete, *Tunnel linings, *Pumping, Reinforcing steels, Slip forms, Fibers, Design, Formulations, Concrete durability, Aggregates.
 Identifiers: Ferrocement, DOT/4CZ/CC, DOT/4BZ/BC.

Fiber reinforced, quick-setting cement concrete mix designs are suggested for use in the development of a prototype extruded liner system. These mix designs can meet the structural and durability requirements of the tunnel liner and can be placed in a slipform by pumping. The mix designs are governed mainly by the fact that the mix must be pumpable. Aggregate shape and gradation are critical. A mix with a high likelihood of pumpability can be formulated by adherence to a procedure based on prevention of segregation failure, the most common pumping failure mode of fiber reinforced concrete. Fiber reinforced concrete mixes proportioned for pumping are of high strength, by normal standards, because of the paste content necessary for workability. Conventional pumping equipment is believed adequate for placing properly designed fiber reinforced concrete mixes if components are selected to minimize line head losses and minimize remolding of the concrete. Mixes for a specific field application should be tested for set times, pumpability and strength, using field proce-

dures for batching, mixing, and placing, prior to actual field use.

PB-248 899/7 PC A04/MF A01
 Smithsonian Institution, Washington, D.C.
The Biological and Ecological Effects of Oil Pollution In Tropical Waters. An Annotated Bibliography
 Jul 73, 72p.
 Contract AID/csd-2608

Descriptors: *Oil pollution, *Ecology, *Marine biology, *Tropical regions, *Bibliographies, Altitude, Crude oil, Aquatic animals, Shellfish, Aquatic plants, Marshes, Toxicity, Petroleum products, Shores, Mortality, Cold weather tests, Oil wells, Refineries, Outfall sewers, Bacteria, Fishes, Hydrocarbons, Biodegradation, Phenols, Oils, Fisheries, Coasts, Oil spills, Environmental impacts.
 Identifiers: High altitude, Oil water interfaces.

The bibliography does not pretend to be complete nor does it include unpublished surveys recently carried out in Indonesia on oil pollution effects. Citations in the annotated bibliography include oil pollution in colder, high altitude waters as well as tropical waters.

PB-249 183/5 PC A05/MF A01
 Georgia Inst. of Tech., Atlanta. Industrial Development Div.
Small-Scale Industry Grant: Soong Jun University Activities
 Final rept. 10 Jan 74-9 Jan 75
 Yoon Bae Ouh, and Nelson C. Wall. Jan 75, 76p
 Contract AID/ta-C-1062
 See also PB-249 184.

Descriptors: *Economic development, *Businesses, *South Korea, *Employment, Technical assistance, Project planning, Information centers, Universities, Industrial training, Education.
 Identifiers: Small businesses, Soong Jun University, Employment programs, Curriculum development.

The main objectives of the project are to generate employment outside metropolitan centers and to provide assistance to small-scale industries in selected areas in Korea. The report describes in detail the background, objectives, and activities of the program and outlines the results achieved and the conclusions reached by the project staff.

PB-249 184/3 PC A03/MF A01
 Georgia Inst. of Tech., Atlanta. Industrial Development Div.
Small-Scale Industry Grant: Baseline Data-Areas of Brazil Served by Educational Foundation of South Santa Catarina
 Jan 75, 27p.
 Contract AID/ta-C-1062
 See also PB-249 185.

Descriptors: *Economic development, *Technical assistance, *Brazil, Industries, Statistical data, Classifications, Economic surveys, Employment, Sales, Urban areas, Businesses.
 Identifiers: Small businesses, Santa Catarina(Brazil).

This report consists of a series of tabular displays of data on the area to be served by the Education Foundation of South Santa Catarina (FESSC.) The data include an identification of existing industry by classification, size, number of firms, number of workers, and total sales. Detailed information by industrial classification is provided for South Santa Catarina, and the cities of Tubarao, Braco do Norte, and Laguna. Industry totals (number of firms, number of employees, and sales of industrial establishments) are given for each city within each of the two municipal association areas. In addition, population and land area data are listed for municipal association areas of Santa Catarina and for all cities within the two municipal association areas comprising the FESSC service area.

PB-249 185/0 PC A06/MF A01
 Georgia Inst. of Tech., Atlanta. Industrial Development Div.

Small-Scale Industry Grant: Fundacao Educacional do Sul de Santa Catarina Activities
 Final rept. 10 Jan 74-9 Jan 75
 Jose Muller, and Nelson C. Wall. Jan 75, 112p
 Contract AID/ta-C-1062
 See also PB-249 186.

Descriptors: *Economic development, *Businesses, *Brazil, Grants, Universities, Developing countries, Industries, Projects, Performance evaluation, Technology, Centers, Industrial training, Education, Organizing, Technical assistance, Management.

Identifiers: Small businesses, Santa Catarina(Brazil), Fundacao Educacional do Sul.

In 1974 the Agency for International Development (AID) funded a contract through which the Georgia Institute of Technology (GIT) was to make \$45,000 grants for small-scale industry programs to two institutions of higher learning to be selected in different geographic regions of the world. This is the final (end-of-the-year) report for the work performed jointly by the staff of the Fundacao Educacional do Sul de Santa Catarina (FESSC) in Brazil and the Georgia Institute of Technology. Additional sections of this report describe the background, objectives, activities scheduled in the program of work, results achieved, and the conclusions reached by the project staff.

PB-249 186/8 PC A03/MF A01
 Georgia Inst. of Tech., Atlanta. Industrial Development Div.
Small-Scale Industry Grant: Administration Project-Stimulating the Growth of Small-Scale Industry
 Final rept. 10 Jan 74-9 Jan 75
 Nelson C. Wall. Jan 75, 30p
 Contract AID/ta-C-1062
 See also PB-249 187.

Descriptors: *Economic development, *Developing countries, *Technical assistance, *South Korea, *Brazil, Projects, Universities, Grants, Surveys, Evaluation, Operations, Objectives, Industrial training, Education, Businesses, Industries, Stimulation, Criteria.

Identifiers: Small businesses, Fundacao Educacional do Sul, Santa Catarina(Brazil), Soong Jun University, Seoul(Korea), Georgia Institute of Technology.

The Agency for International Development (AID) funded a contract through which the Industrial Development Division (IDD) of the Engineering Experiment Station at the Georgia Institute of Technology was charged with the responsibility of implementing a specific program of work in the area of 'Stimulating Growth of Small-Scale Industry' by providing technical assistance grants to two counterpart institutions. The administrative portion of the contract was assigned the project number A-1600 by the contracting office at the Georgia Institute of Technology. This is the final report of Year 1 of this project which has been implemented in two different geographic regions of the world. The two selected counterpart institutions were Soong Jun University, Seoul, Korea, and the Fundacao Educacional do Sul de Santa Catarina, Tubarao, Brazil.

PB-249 288/2 PC A03/MF A01
 Arizona Univ., Tucson.
Land Use Problems and Research Needs in the High-Altitude Zone of Ecuador
 Edwin Lamar Smith, Jr., and Jack L. Stroehlein. Oct 75, 47p

Descriptors: *Land use, *Ecuador, Land, Natural resources, Management, Watersheds, Wildlife, Irrigation, Vegetation, Soils, Developing countries, Forestry, Fisheries.

Identifiers: High altitude.

The objectives of the study were: (1) to evaluate the nature and extent of problems associated with use of the high altitude lands of Ecuador, (2) to assess the significance of these problems and the possibilities of solving them through research and/or other types of projects, (3) to analyze priorities and capabilities of various institutions involved in natural resource development and management, and (4) to outline a program for solution of land use

SELECTED APPROPRIATE TECHNOLOGIES

problems and identify those areas in which cooperation with external institutions is needed.

PB-249 317/9 PC A15/MF A01
Monsanto Research Corp., Dayton, Ohio. Dayton Lab.

Development of Low-Cost Roofing from Indigenous Materials in Developing Nations

Annual rept. no. 2, May 74-Sep 75
Ival O. Salyer, George L. III Ball, Arthur M. Usmani, and Dennis W. Wermeister. 18 Dec 75, 349p Rept no. MRC-DA-517
Contract AID/CM/ta-C-73-12
See also PB-239 493.

Descriptors: *Roofing, *Developing countries, *Composite materials, Fibers, Fillers, Binders(Materials), Bagasse, Rubber fibers, Thermoplastic resins, Weathering, Cost estimates, Cri-
teria, Philippines, Jamaica, Ghana, Zambia.

This report covers Phase II (May 1974 through September 1975) of a 3-1/2 year research effort to match indigenous fibers and fillers with low cost binders to produce improved roofing for developing countries. The project emphasis during Phase II was on roofing materials development, and establishing the mechanism for the transfer of the technology. Four candidate composite roofing material systems were defined that use between 70 and 100% indigenous material. Outstanding as a filler is the sugar cane residue, bagasse. The primary candidate binders include natural rubber, phenolic, and commercial thermoplastic resins. Accelerated and outdoor aging demonstrate the viability of the candidate systems. The objectives of the technology transfer aspects included defining potential collaborative institutions and individuals of Jamaica, the Philippines, Zambia and Ghana and locating qualified organizations interested in future commercial production of the roofing.

PB-249 367/4 PC A03/MF A01

Georgia Inst. of Tech., Atlanta. Engineering Experiment Station.

Employment Generation Through Stimulation of Small Industries. Provisional Keyword Index of the Small-Scale Industry Case Studies

Feb 75, 36p
Contract AID/csd-3175
Paper copy also available in set of 3 reports as PB-249 366-SET, PC E99.

Descriptors: *Employment, *Industrial relations, *Economic surveys, Subject indexing, Businesses, Industries, Data acquisition, Developing countries, Projects, Universities, Indexes(Documentation), Terminology.
Identifiers: Small businesses, Key words, Case histories.

One of the continuing objectives of the Industry Development Division (IDD) under the U.S. Agency for International Development 211 (d) grant program is to acquire case histories of small-scale industry, particularly those in developing countries. For this project, case material was requested from various organizations in many countries, as well as located in published bibliographies and indexes. This work is the first effort of the International Development Data Center (IDDC) (hence the title Provisional Keyword Index) to abstract and index those case histories currently held in the IDDC collection. The keyword index is in two parts. The first section is an alphabetical list of the keywords and their scope notes. The second section is an alphabetical arrangement of the keywords and their related case history titles.

PB-249 369/0 PC A04/MF A01
Georgia Inst. of Tech., Atlanta. Engineering Experimental Station.

Employment Generation Through Stimulation of Small Industries. List of Subject Headings Used by the International Development Data Center

Linda M. Wagenveld, and Richard Johnston. Feb 74, 62p
Contract AID/csd-3175
Paper copy also available in set of 3 reports as PB-249 366-SET, PC E99.

Descriptors: *Employment, *Developing countries, *Industries, Subject indexing, Documentation, Definitions, Information retrieval, Search structuring, International relations, Information systems.

The purpose of this list of economics and employment subject headings is to provide definitions of terms used. The compilation should enable catalogers to be consistent in selecting subject headings, and enable card catalog users to be more efficient in searches. The list is compiled from industry and labor subject headings for publications now in the collection of the International Development Data Center. Many of the terms are used at the Georgia Institute of Technology and may have different or conflicting meanings in an international orientation.

PB-249 585/1 PC A10/MF A01
Office of Water Research and Technology, Washington, D.C. Water Resources Scientific Information Center.

Irrigation Return Flow. A Bibliography
Dec 75, 213p Rept nos. OWRT/WRSIC-75/209, W76-04230

Descriptors: *Irrigation, *Water flow, *Salinity, *Bibliographies, Water pollution, Inorganic nitrates, Water quality management, Abstracts, Irrigation canals, Surface water runoff, Water conservation, Clay soils, Salt water, Fluid infiltration, Grasses, Mathematical prediction, Hydrology, Water reclamation, Arid land, Waste water reuse.
Identifiers: *Return flow.

The report, containing 132 abstracts, is another in a series of planned bibliographies in water resources produced from the information base comprising SELECTED WATER RESOURCES ABSTRACTS (SWRA). At the time of search for the bibliography, the data base had 89,737 abstracts covering SWRA through October 15, 1975 (Volume 8, Number 20). Author and subject indexes are included.

PB-249 731/1 PC A08/MF A01

Agricultural Research Service, Washington, D.C.
Cotton Boll Rot. Laying Out a Trial of a Method of Control (La Pourriture des Capsules du Cotonnier: Essai de Mise en Place d'une Methode de Lutte)

J. Caquil. 1975, 152p* Rept no. TT-75-55027
Trans. of Coton et Fibres Tropicales (France), v28 n2,3,4 1973, by Margaret Duggan Saidi, and Linda Paul. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Cotton plants, *Pest control, *Fungus diseases, *Bacterial diseases, Damage assessment, Fungi, Cell wall, Penetration, Resistance, Plant genetics, Vulnerability, Cell morphology, Fungus deterioration, Developing countries, Africa, Translations, France, Books.
Identifiers: *Gossypium hirsutum, *Boll Rot.

In recent years, progress in the cultivation of cotton has been very marked, thanks to the creation of productive varieties with good industrial qualities, and the use of chemical fertilizers and of the increase in the area of land protected against insects. Growers, however, remain defenseless against the damage caused by boll rot, which affects, on an average 10 to 20% of the fruit. The object of this study conducted mainly at the Central Station of the Research Institute for Cotton and Exotic Textiles at Bamberg (Central African Republic) is to perfect a method of control to limit this damage. The present study proposes to define the different type of damage suffered by the fruit, to identify the organisms responsible and their mode of penetration, to define the obstacles the boll presents to the attack of parasites, and the principles of a method of control.

PB-250 629/3 PC A10/MF A01
Georgia Inst. of Tech., Atlanta, Industrial Development Div.

Employment Generation Through Stimulation of Small Industries. Small-Scale Industry Development in Ecuador
Case History Apr 73-Dec 74
Nelson C. Wall. Feb 75, 205p
Contract AID/csd-3175
See also PB-250 628.

Descriptors: *Employment, *Ecuador, *Economic surveys, Businesses, Manpower utilization, Income, Production, Project planning, Stimulation, Industries.
Identifiers: Small businesses, Artisans.

This case history represents some 18 months of research carried out by the author on site in Ecuador in an attempt to get a first hand picture of the situation. Among the findings of this study are the following: Artisan enterprises and cottage activities employ well over 200,000 persons, who, in general, manage to earn enough to provide for a precarious existence. In most cases, the artisan performs his activity to generate additional income for his family needs. These persons would be better off with an industrial job if jobs were available. Great confusion and misunderstanding exist in the interpretation of the existing laws which govern artisans and small-scale industries. There is need for a well-reasoned, logical, pragmatic action plan which will address the present situation and assure obtainable goals over the next decade.

Descriptors: *Industrial mobilizing, *Paraguay, *Regional planning, Developing countries, Investments, Urban areas, Rural areas, Organizations, Projects, Industries, Economic development, Stimulation, Exports, Networks.
Identifiers: Small businesses.

The Industrial Development Division (IDD) of the Engineering Experiment Station at the Georgia Institute of Technology has recently completed a three-year program designed to assist the Ministry of Industry and Commerce of the Republic of Paraguay in its efforts to create a chain structure of regional development organizations, as well as to generate small-scale industries in rural-urban locations. The main objective of the project was to generate investments outside of the capital city of Asuncion and, if possible, to develop small export-oriented industries.

PB-250 628/5 PC A02/MF A01
Georgia Inst. of Tech., Atlanta. Industrial Development Div.

Employment Generation Through Stimulation of Small Industries. A Seven-Country Survey of Certification Licensing and Quality Marks Programs
Kenneth S. Stephens. Mar 75, 25p
Contract AID/csd-3175
See also PB-250 629.

Descriptors: *Employment, *Industrial relations, *Thailand, Businesses, Manpower utilization, Developing countries, Questionnaires, Data acquisition, Industries, Stimulation, Standards, Licenses, Surveys, Project planning.
Identifiers: Small businesses, Certification.

The survey materials consisted of a relatively simple questionnaire and a package of related materials on the certification program of Thailand, including a completed questionnaire on the current Thai program to serve as a guide. The survey requested completion of the questionnaire together with supplementary materials on the certification programs under way in responding countries. The purpose of the survey was two-fold: (1) to obtain information on certification programs which would be helpful to Thailand in its efforts to establish and further implement its own program, and (2) to assist other countries in planning or further developing their efforts by giving them a comparison of the features of certification programs in various stages of development in other countries.

PB-250 629/3 PC A10/MF A01
Georgia Inst. of Tech., Atlanta, Industrial Development Div.

Employment Generation Through Stimulation of Small Industries. Small-Scale Industry Development in Ecuador
Case History Apr 73-Dec 74
Nelson C. Wall. Feb 75, 205p
Contract AID/csd-3175
See also PB-250 628.

Descriptors: *Employment, *Ecuador, *Economic surveys, Businesses, Manpower utilization, Income, Production, Project planning, Stimulation, Industries.
Identifiers: Small businesses, Artisans.

SELECTED APPROPRIATE TECHNOLOGIES

PB-250 848/9 PC A16/MF A01
National Bureau of Standards, Washington, D.C.
Center for Building Technology.
FY75 Progress Report on Design Criteria and Methodology for Construction of Low-Rise Buildings to Better Resist Typhoons and Hurricanes

Final rept. 1 Jul 74-30 Jun 75
Richard D. Marshall, and Noel J. Raufaste, Jr.
Nov 75, 354p* Rept no. NBSIR-75-790
Grant PASA-TA(CE)-04-73
See also report dated 1 Jul 74, COM-74-11631.

Descriptors: *Tropical cyclones, *Houses, *Design criteria, Construction, Construction materials, Wind tunnel models, Wind pressure, Technology transfer, Philippine Islands, Building codes, Developing countries.

Identifiers: *Natural disasters, *Low rise buildings.

This report represents the major accomplishments conducted during the third phase (FY75) of a three year project to develop improved design criteria for low-rise buildings in developing countries to better resist extreme winds. The research study sponsored by the Agency for International Development commenced in March 1973. Two other reports were prepared; NBSIR 74-582 FY73 Progress Report (first phase of the research--4 months) and NBSIR 74-567 FY74 Progress Report (second phase of the research--12 months). During FY75, 6 major tasks were completed (instrumentation of fifth and sixth of six test houses to collect full scale field wind data, continuation of technician training at the field sites and at the wind tunnel facility, analysis of extreme wind data, development of draft improved design criteria reports, participation in regional conferences in Manila and scheduling of regional dissemination of project results conference in Jamaica for November 1975). Research activities will be completed in December 1975. A final report will be published by the end of FY76.

PB-250 966/9 PC A10/MF A01
Utah State Univ., Logan. Inst. for Social Science Research on Natural Resources.

The Social Well-Being and Quality of Life Dimension in Water Resources Planning and Development

Wade H. Andrews, Rabel J. Burdge, Harold R. Capener, W. Keith Warner, and Kenneth P. Wilkinson. Jul 73, 218p OWRT-X-125(3752)(1)
Contract DI-14-31-0001-3752

Proceedings of the Conference of the University on Water Resources held at Logan, Utah on 10-12 Jul 73.

Descriptors: *Water resources, *Regional planning, *Social effect, *Meetings, Quality of life, Objectives, Government policies, Organizations, Management methods, Guidelines, Information systems, Project planning, Models, Rural areas, Urban areas.

Papers by academicians are reported dealing with concepts, measurements, and research findings, plus response papers from representatives of government and private organizations. Topics include the background of development of social wellbeing as a relevant value in planning and evaluation of water resources; problems in the political process in adopting social indicators and problems of organizing for needed research of a national character with thinly scattered personnel; methodology and some results in research relating to social goals; quality of life and water resources; an overview of theoretical and conceptual issues; and finally a synthesis of these elements concerning possibilities and conditions related to dealing with social well-being as a functional account in planning and evaluating water resources development.

PB-251 034/5 PC A15/MF A01
Iowa State Univ., Ames. Dept. of Economics.
Management of Water Quality Through Selected Institutions and Instruments

Doctoral thesis
Philippus Hendrik Spies. 1973, 346p OWRT-B-015-IA(5)

Descriptors: *Water quality management, *Rural areas, *Skunk River Basin, Allocations, Social effect, Decision making, Cost analysis, Water

rights, Sediments, Economic factors, Erosion control, Prices, Theses, Iowa.
Identifiers: Institutional framework.

The importance and interrelationships of planning, organization-coordination, and control of water quality management are analyzed as applicable to the water quality problem in a rural area. Spillover effects on water quality management are identified and evaluated in terms of efficiency and equity, by analyzing resource allocation within market and property systems. A model was developed for maximizing social benefits subject to specific water quality restrictions and applied to the Upper Skunk River Basin in Central Iowa. An institutional framework for water quality control was developed. Water quality planning may be simplified by application of charges to point source pollutants and standards to diffused pollutants. To allow for optimal planning and allocation of water qualities over time, it may be necessary to specify rights in water qualities by tenure contracts between public and user.

PB-251 094/9 PC A19/MF A01
Volunteers in Technical Assistance, Mt. Rainier, Md.

Manuel Technique du Village

6 Feb 76, 430p
Trans. of mono. Village Technology Handbook, 1st edition, v1, v2 1963. Text in French. Prepared in cooperation with Agency for International Development, Washington, D.C. Communications Resources Div.

Descriptors: *Urban planning, *Rural areas, *Technology, *Handbooks, Rural urban fringe, Agriculture, Sanitation, Water supply, Housing planning, Grains(Food), Vegetables, Education, Telecommunication, Construction, Translations.
Identifiers: *Villages.

Village-level technology and plans cover the following topics: village water supply, sanitation, agriculture, grain and produce handling and preservation, housing and construction, home improvement, and education and communication.

PB-251 166/5 PC A02/MF A01
Colorado State Univ., Fort Collins. Dept. of Civil Engineering.

Precipitation Management for Reclamation of Overgrazed Areas in Arid and Semi-Arid Regions

Completion rept.
Neil S. Grigg. Jan 76, 13p OWRT-A-026-COLO(1)
Contract DI-14-31-0001-5006

Descriptors: *Mine waters, *Spoil, *Vegetation, *Precipitation(Meteorology), Strip mining, Arid land, Semiarid land, Feasibility, Environmental impacts, Land reclamation, Economic development, Wildlife, Social effect, Cost analysis, Management. Identifiers: Revegetation, Strip mine wastes.

An investigation was made of the feasibility of using precipitation management as a method for the vegetative restoration of strip mine spoils in arid and semi-arid areas, and for the economic and environmental improvement of reclaimed mine spoils. The procedure is believed to be capable of producing vegetative systems of higher economic and wildlife habitat value than exists naturally on these same lands or might be produced by other non-irrigated methods. It would appear that the cost of the necessary R and D program would be minimal, particularly when compared with the potential economic, environmental and social benefits which would accrue.

PB-251 192/1 PC A04/MF A01
Texas A and M Univ., College Station. Dept. of Agricultural Economics and Rural Sociology.

Utilization of Finfishes Caught Incidental to Shrimp Trawling in the Western Gulf of Mexico. Part II: Evaluation of Costs

John P. Nichols, Melvin Cross, Vito Blomo, and Wade L. Griffin. Jan 75, 51p TAMU-SG-76-203, NOAA-76020402
Grant NOAA-04-3-158-18
See also Part I dated Jun 74, COM-74-11809.

Descriptors: *Fishing, *Mexico Gulf, *Marketing, Marine fishes, Value engineering, Prices, Marketing, Cost estimates, Merchant ships, Cost analysis, Shrimps.
Identifiers: Sea Grant program, Finfishes.

The report presents estimates of the cost of operating several alternative systems for holding and landing finfish caught incidental to shrimp trawling operations. Freezer units, brine immersion tanks, an on-board fish meal plant, and extra crew member and a mother-ship concept are the systems evaluated. Break-even prices are estimated that would be necessary to cover operating costs and a 10 percent return on investment. Additionally, problems in traditional work patterns, crew incentives, and institutional arrangements are discussed. Comparison of estimated break-even prices with recent market prices indicate that none of the proposed systems are viable except under very restrictive conditions. The mother-ship or tender vessel concept shows the most economic potential but is plagued with problems of coordinating a large number of vessels in an industry where independence of operation is valued highly. The analytical model presented may be used to evaluate other systems not considered directly in this study.

PB-251 291/1 PC A08/MF A01
Ross Hofmann Associates, Coral Gables, Fla.
Evaluation of Small Modular Incinerators in Municipal Plants

Final rept.
1976, 155p EPA/530/SW-113c
Contract EPA-68-01-3171

Descriptors: *Air pollution, *Incinerators, *Solid waste disposal, Monitoring, Refuse disposal, Heat recovery, Steam heating, Cost analysis, Management planning, Urban planning, Fuels, Combustion.

Identifiers: *Air pollution sampling.

This report describes in detail the results of monitoring three small municipal incinerators, including one that incorporates steam recovery. The three incinerators tested were all under 50 TPD design capacity per furnace and were burning typical municipal solid waste. Cost information was accumulated for each facility and, where applicable, revenue from steam sales was included. Operational, performance, and environmental analyses were performed for all units involved. This report is the latest state-of-the-art report on small incineration, should serve as a guide for municipalities considering such a system, and can be used for comparison purposes in future solid waste system evaluations.

PB-251 377/8 PC A10/MF A01
Clemson Univ., S.C. Water Resources Research Inst.

Multi-Objective Water Resources Planning: Methodology to Achieve Compatibility Between Environmental Amenities and Economic Development

Completion rept. 1 Jul 72-30 Jun 74
David W. York, Benjamin C. III Dysart, and Lawrence W. Gahan. May 75, 224p* WRRI-55, W76-05840
Prepared by Clemson Univ., N.C. Dept. of Environmental Systems Engineering.

Descriptors: *Water resources, *Recreation, *Economic development, Water supply, Industries, Water consumption, Benefit cost analysis, Mathematical models, Optimization, Management, Mineral deposits, Manufacturing, Mining, Great Santee Swamp, South Carolina.
Identifiers: *Water management(Applied), *Competing uses.

A mathematical model of multiple-use in natural areas was developed. The model represents a unified system for the evaluation of cases where traditional forms of economic development such as industrial manufacturing, suburban residential expansion, or mineral extraction are proposed for relatively natural areas having significant environmental amenity values. The model system is a unique benefit-cost analysis that allows for a rational comparison of the costs and benefits associat-

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ed with both developmental and environment-related activities. The option value has been incorporated into the analysis, and methods have been devised for the estimation of desirability. The model was applied to a study of multiple-use management of the Great Santee Swamp in South Carolina.

PB-251 396/8 PC A21/MF A01

Mitre Corp., McLean, Va.

International Symposium on Energy, Resources and the Environment (5th) Held at Kuala Lumpur, Malaysia on 17-20 February 1975

M. Rifkin. Dec 75, 477p Rept no. M75-84

See also PB-219 952-SET.

Descriptors: *Energy, *Environmental impacts, *Meetings, Natural gas, Petroleum, Malaysia, Indonesia, Philippines, Energy management, Energy source conservation, Energy reserves, Energy policy, Solid waste disposal, Reclamation, Economics, Agriculture, Fertilizers, Singapore, Australia, Thailand, Nuclear energy, Southeast Asia.

Identifiers: Developing countries.

A partial listing of topic areas includes: The role of and need for technology in society; Economic development and prospects for mankind; Southeast Asia perspective; The place of energy in world peace; Dimensions of world energy; Nuclear energy infrastructure requirements; Energy scenarios for the future; Livestock and urban waste as future energy resources; Impact of energy resources on agriculture in a developing country; Energy, fertilizer and food; Resource management and international cooperation with special reference to Malaysia; National energy policy as it affects economic development.

PB-251 471/9 PC A06/MF A01

Carnegie-Mellon Univ., Pittsburgh, Pa. Interdisciplinary Working Party.

Feasibility Test of an Approach and Prototype for Ultra Low Cost Housing

Final rept. Dec 74-Aug 75.

Nov 75, 101p TA/OST-75-26

Contract AID/ta-C-1174

Descriptors: *Residential buildings, *Socioeconomic status, *Construction materials, Projects, Developing countries, Disasters, Rural areas, Cost analysis, Structural design.

Identifiers: Emergency housing, Disaster prone areas, *Low cost housing, Indigenous materials.

This report outlines the activities in a housing effort to develop a prototype ultra low-cost housing unit for use in a variety of relief and rural development situations, especially in disaster prone areas of the developing countries. The structure is an 'A' frame modular housing system which can use a wide variety of local indigenous materials in a structure which is extremely cheap, labor intensive, easily erected, and wind and flood resistant.

PB-251 520/3 PC A04/MF A01

National Academy of Sciences, Washington, D.C. **Natural Products for Sri Lanka's Future. Report of a Workshop Held at Colombo, Sri Lanka, on 2-6 June, 1975**

1975, 61p.

Contract AID/csd-2584

Prepared in cooperation with National Science Council of Sri Lanka, Colombo.

Descriptors: *Economic development, *Developing countries, *Ceylon, *Meetings, Natural resources, Planning, Project planning, Horticulture, Food industry, Medicinal plants, Oils, Seasonings, Drugs, Recommendations.

Identifiers: Workshops, *Sri Lanka, Essential oils, Spices, Underutilization, Exotic plants.

This final report is the product of a workshop jointly sponsored by the National Science Council of Sri Lanka (Ceylon) and the National Academy of Science of the U.S. The workshop's purpose was to identify scientifically sound projects that exploit natural products, that are realistic for Sri Lanka, and that can significantly contribute to the nation's

economic and scientific development. This report, which has resulted from the joint deliberations of the Ceylonese and American workshop participants, presents a number of suggestions for improvement of ongoing programs, for marshalling latent resources, and for experimenting with new food and export crops. Suggestions and recommendations have resulted from the pooled knowledge and experience of all participants and are presented in several chapters that reflect the subject matter of the working sub-groups of the workshop.

PB-251 565/8 PC A03/MF A01

Olson Labs., Inc., Anaheim, Calif.

Guidelines for Quality Assurance Programs for Mobile Source Emissions Measurement Systems: Phase IV. Heavy-Duty Gasoline Engines - Test Procedures

Final rept.

Harold Wimette, Rod Pilkington, and Tom Kelly.

Jun 75, 37p EPA/650/4-75/024h

Contract EPA-68-02-1740

See also PB-251 564.

Descriptors: *Air pollution, *Exhaust gases, *Automobiles, *Quality control, Test methods, Dynamometers, Gas analysis, Urban areas, Carbon monoxide, Carbon dioxide, Hydrocarbons, Nitrogen oxides.

Identifiers: *Heavy duty vehicles.

Test Procedures for Heavy Duty Gasoline Engines
Mobile Source Emissions Measurement Systems are presented with the concept of a total Quality Assurance System. The Test Procedures are presented in document control format and give the detailed test procedures with Quality Assurance provisions for each part of the total testing system. This volume is a supplement to EPA-650/4-75-024-d, Guidelines for QA Programs for Mobile Source Emissions Measurement Systems, Phase II, Heavy Duty Diesel Engines - Test Procedures.

This volume is a supplement to EPA-650/4-75-024-d, Guidelines for QA Programs for Mobile Source Emissions Measurement Systems, Phase II, Heavy Duty Diesel Engines - Test Procedures.

PB-251 890/0 PC A02/MF A01

Massachusetts Univ., Amherst. Water Resources Research Center.

The Effect of Land Use On the Chemical and Physical Quality of Surface and Ground Waters In Small Water Sheds

Martin E. Weeks. Sep 74, 13p Completion 74-7, Pub-41, OWRT-A-040-MASS(1)

Descriptors: *Land use, *Agricultural wastes, *Water pollution, *South River Watershed, Inorganic nitrates, Fertilizers, Inorganic phosphates, Ground water, Surface waters, Nitrification, Cattle, Water quality, Humus, Sewage, Lysimeters, Septic tanks, Massachusetts.

Identifiers: Denitrification, Manure.

Results obtained from monitoring surface and ground waters gave only a qualified answer to the question of how to obtain some initial estimate of the effects of different land use patterns on water quality in the small watershed of South River. Agricultural wastes come largely from manure produced by the nearly 1100 head of cattle on the farms in the area, and from crop residues, and, to a lesser extent, from fertilizers used. The houses of residence, including those in Ashfield and Conway centers, contribute most of the effluents from septic tanks and considerable raw sewage directly to the South River. Eight stations were located at different places along the stream; water samples from the river at each of these stations were taken on a monthly basis for analysis. Low ground water phosphate concentrations were always found in lysimeters located in an area of the watershed where different soil management practices could be studied. No evidence of leaching was found from three field sites receiving moderate to sometimes heavy applications of manure and fertilizers.

PB-252 683/8 PC A20/MF A01

National Bureau of Standards, Washington, D.C. Inst. for Applied Technology.

Wind and Seismic Effects - Proceedings of the Joint Panel Conference of the U.S.-Japan Cooperative Program in Natural Resources (6th) Held at National Bureau of Standards, Gaithersburg, Md. on May 15-17, 1974

Final rept.

H. S. Lew. Apr 76, 465p* Rept no. NBS-Special Pub 444

Library of Congress catalog card no. 76-608055.

Descriptors: *Structures, *Earthquakes, *Wind pressure, *Meetings, Dynamic structural analysis, Design criteria, Dynamic response, Gust loads, Wind(Meteorology), Volcanism, Earthquake resistant structures, Developing countries.

Identifiers: *Natural hazards, *Natural disasters, *Earthquake engineering.

The Sixth Joint Meeting of the U.S. - Japan Panel on Wind and Seismic Effects was held in Washington, D.C., on May 15-17, 1974. The proceedings of the Joint Meeting include the opening remarks, the program, the formal resolutions, and the technical papers. The subject matter covered in the papers includes extreme winds in structural design; assessment and experimental techniques for measuring wind loads; dynamics of soil structures and ground response in earthquakes; structural response to wind and earthquakes and design criteria; disaster mitigation against natural hazards; and technological assistance to developing countries.

PB-253 525/0

PC A02/MF A01

National Weather Service, Fort Worth, Tex. Southern Region.

Objective Forecasting of Pan Evaporation - Two Contributions

Technical memo.

Nicholas P. Cimino, and Johnnie B. Graham. Mar 76, 17p NOAA-TM-NWS-SR-85, NOAA-76031606

Descriptors: *Climatology, *Weather forecasting, *Irrigation, *Evaporation, Atmospheric temperature, Humidity, Wind(Meteorology), Numerical analysis, Agriculture, Semiarid land, Texas, Oklahoma.

Identifiers: *Pan evaporation, Objective weather forecasting, *Agroclimatology.

This memorandum consists of two articles on forecasting of pan evaporation. The first, An Aid to Agricultural Evaporation Forecasting, offers a linear equation which estimates 24-hour pan evaporation as a function of means of temperature, relative humidity, and 20-foot winds. Since these three variables are routinely forecast, application of this evaporation equation is fairly straight-forward. The second article, An Objective Method of Forecasting Total Open-Pan Evaporation for a 48 Hour Period on the Texas South Plains, Using Some Parameters from the FOUS68 Message, introduces an equation thought to produce meaningful forecasts of 48 hour open-pan evaporation observed at the Texas A and M Research and Extension Center at Lubbock, Texas.

PB-253 652/2

PC A07/MF A01

Miami Univ., Fla. Sea Grant Institutional Program. **Preliminary Experimentation in the Development of Natural Food Analogues for Culture of Detritivorous Shrimp**

Steven Y. Newell, and Jack W. Fell. Jul 75, 130p Sea Grant Technical Bull-30, NOAA-76031605

Grant NOAA-04-5-158-14

Descriptors: *Shrimps, *Feeding stuffs, *Fungi, Wheat, Fermentation, Bagasse, Animal nutrition, Aquatic microbiology, Proteins, Food chains, Aquaculture.

Identifiers: Sea Grant program, Penaeus duorarum, Penaeus setiferus.

A three year research program is described that has tested whether agricultural by-products can be inexpensively converted into fungal materials simulating the micro-bial-detrital complexes naturally eaten by several estuarine animals of commercial food value, including penaeid shrimp. If successful, a low-price feed could be developed to enhance commercial productivity of the shrimp. Fungal fermentations of agricultural by-products were conducted and attempts were made to optimize fungal

SELECTED APPROPRIATE TECHNOLOGIES

protein production. Resultant artificial detrital feeds were tested on a proto-commercial scale in outgrowth of penaeid shrimp. Yields of shrimp ranged from very poor to encouragingly high, considering conditions imposed. Screening was begun of fungal capability to degrade the least expensive types of agricultural by-products, when these were modified to reduce lignin-associated refractoriness.

PB-253 787/6 PC A03/MF A01
Transportation Research Board, Washington, D.C.
The Bicycle as a Transportation Mode
Edward I. Koch, Daniel T. Smith, Jr., Robert D. Theisen, Carl E. Ohrn, and J. C. Oppenlander. 1976, 50p* Rept nos. TRB/TRR-570, ISBN-0-309-02483-8

Descriptors: *Bicycles, *Transportation, *Urban transportation, Routes, Design standards, Vehicular traffic control, Safety, Legislation, Intersections, Travel demand, Traffic safety, Citizen participation. Identifiers: *Bikeways, *Highway safety.

Contents: Bicycles and legislation; Planning and design of bicycle facilities--pitfalls and new directions; Planning and designing a demonstration bikeway; Predicting the type and volume of purposeful bicycle trips; Development of a planning process for a functional and recreational bicycle system; Establishing warrants for control of a bicycle crossing through simulation; Problems in integrating bicycle travel into the urban transportation planning process; Citizen participation in bicycle planning from the public agency's viewpoint--why and is it worth the effort; A highway safety standard for bicycle facilities.

PB-254 272/8 PC A02/MF A01
Environmental Protection Agency, Washington, D.C. Office of Pesticide Programs.

Chemical Safety - Pesticides

Homer R. Wolfe. 19 Jul 74, 24p
Prepared in cooperation with Colorado State Univ., Fort Collins. Inst. of Rural Environmental Health. Proceedings of the Annual Conference of Environmental Chemicals - Human and Animal Health (3rd), Held at Fort Collins, Colorado, July 15-19, 1974.

Descriptors: *Pesticides, *Industrial hygiene, Hazards, Toxicology, Toxicity, Personnel, Education, Safety, Industrial atmospheres, Protective clothing, Protective coverings, Protective masks, Human factors engineering, Respirators, Exposure, Skin(Anatomy), Respiratory systems, Chemical industry. Identifiers: *Occupational safety and health, *Toxic substances.

People who become involved in activities requiring exposure to pesticides should be aware of the potential hazards involved as a result of absorption of toxic compounds. If a person is knowledgeable about such hazards and understands the importance of taking proper precautions, he can do much to insure the safety of himself and others. Although illnesses resulting from over-exposure to toxic compounds do occur among applicators and other workers, most are a result of carelessness or accident. Experience has shown that if proper precautionary measures are observed and directions on the pesticide label are followed, even the more toxic compounds can be used safely. Exposure to less toxic compounds should not be ignored.

PB-254 379/1 PC A06/MF A01
Miami Valley Regional Planning Commission, Dayton, Ohio.
A Review of Critical Factors Impacting Regional Water Quality Management

Final rept. Mar 76, 111p Rept no. EPA-208-MVRPC-M8 Report on Areawide Waste Treatment Management Report Program. See also PB-254 378. Prepared in cooperation with Environmental Protection Agency, Washington, D.C. Div. of Water Planning, and Linton and Co., Inc., Washington, D.C.

Descriptors: *Water resources, *Water quality management, *Water supply, *Regional planning, Urban areas, Rural areas, Population growth, Em-

ployment, Land use, Solid waste disposal, Sewage treatment, Industrial waste treatment, Flood plains, Runoff, Legislation, Financing, Reviews, Ohio. Identifiers: Miami Valley Region(Ohio), Institutional framework.

The critical factors - experience, institutional arrangement, and legal and fiscal capabilities - for water quality management, previously discussed in separate reports, are brought together to describe the existing situation in waste treatment, water supply, land use controls, solid waste, storm water, and flood plain control in the Miami Valley (Ohio) area. The information, presented in a narrative with accompanying tables and matrices, is used in the development of the Section 208 (PL 92-500) Areawide Waste Treatment Management Plan.

PB-254 416/1 PC A06/MF A01
North Central Forest Experiment Station, St. Paul, Minn.

Intensive Plantation Culture. Five Years Research
Forest Service General Technical rept. May 76, 122p* Rept no. FSGTR-NC-21

Descriptors: *Forestry, *Forest trees, Wood fibers, Yield, Density(Mass/volume), Plant growth, Harvesting, Plant physiology, Biomass, Nutrients, Pine trees, Fir trees, Plant diseases, Management, Economic development, Wood pulp, Viruses, Particle boards, Insects.

Identifiers: Forest plantations, *Maximum wood yield program, *Populus, Spruce trees.

The report reviews 5 years of progress of the Maximum Fiber Yield program. Twenty separate papers describe achievements and plans for this multiproject program.

PB-254 469/0 PC A05/MF A01
National Bureau of Standards, Washington, D.C. Office of International Relations.

Regional Seminar on a System of Standardization and Metrology for Latin America

Final rept. H. Steffen Peiser, and Robert S. Marvin. Feb 76, 100p Rept no. NBSIR-76-988 Grant PASA-TA(CE)-5-71

Descriptors: *Metrology, *Units of measurement, *Latin America, *Meetings, Standards, Standardization, Information systems, Bolivia, Brazil, Networks, Telecommunication, Ecuador, Quality control, International relations, Food, Technical assistance, Thailand, Industries, Chemical analysis, Developing countries, Personnel development, Foreign countries.

This report contains the papers presented at the first of a series of Regional Seminars, organized under the technical guidance of NBS and sponsored by the U.S. Agency for International Development and the Dirección General de Normas y Tecnología of Bolivia. The Seminar was held at La Paz on the 24th and 25th of June, 1974, with participants from Bolivia, Brazil, Chile, Ecuador, Korea, Peru, Turkey, Thailand, and the United States of America. The Seminar was organized into four sessions, each of one half day duration, covering: Session 1, 'Interactions for Information'; Session 2, 'Interactions for Standards'; Session 3, 'Interactions for Solutions to Technical Problems'; and Session 4, 'Interaction for Training'. Portions of this document are not fully legible.

PB-254 845/1 PC A03/MF A01
Tamil Nadu Dept. of Education, Guindy (India).
Light Engineering Project for the Adult Blind
Final rept. 1965, 31p SRS-19-58120-001 Grant SRS-19-58120

Descriptors: *Vocational guidance, *Blindness, *Rehabilitation, Adults, India, Industries, Education, Projects, Handicapped persons. Identifiers: *Vocational rehabilitation.

To encourage blind persons to become more independent from traditional charity and to enable them to participate in the rapid industrial develop-

ment occurring in the Madras area of Tamil Nadu State, India, a 6-month rehabilitation program trained a total of 121 workers in shop and factory techniques. During the 4-year existence of the project, 51 trained clients obtained industrial jobs at salaries comparable to sighted workers. The project included workshop and 'on-the-job' training as well as training in travel and independent living skills.

PB-255 021/8 PC A03/MF A01
Kansas Water Resources Research Inst., Manhattan.

Swine Waste Digestion Enhancement with Nutrient Separation
Project completion rept. 1 Jul 74-30 Jun 75 Lawrence A. Schmid, and Ralph I. Lipper. Jun 76, 37p Contrib-173, OWRT-A-063-KAN(1) Contract DI-14-31-0001-5016

Descriptors: *Agricultural wastes, *Digestion(Decomposition), *Swine, *Industrial waste treatment, Anaerobic processes, Waste water, Mixing, Separation, Ammonia, Stripping(Distillation), Removal, Carbon dioxide, Methane, pH, Anaerobic bacteria, Nutrients.

A swine waste anaerobic digester receiving the waste from 80 boars was operated for a period of ten months. Digester mixing and nutrient removal were accomplished by the recirculation of digester gases through two stripping units. Phosphoric acid was used to strip ammonia from the recirculated gas stream. Caustic solutions, primarily lime, were used to strip carbon dioxide. The removal of carbon dioxide resulted in an elevation of digester pH to 8.0. At the elevated pH ammonia was more readily stripped. A system specific ammonia desorption coefficient was determined which may be used for selecting gas flow rates. The selection of the proper gas flow rate can provide the required degree of ammonia removal to reduce ammonia concentrations to levels non-toxic to anaerobic bacteria.

PB-255 104/2 PC A02/MF A01
Institute for Building Science, Budapest (Hungary).
Some Aspects of the Construction of Industrial Projects in Developing Countries - Based on Hungarian Experience

Analysis of development, science organization, informatics bulletin E. Csorba. 19 Dec 74, 15p Rept no. Bull-17

Descriptors: *Construction, *Technical assistance, Developing countries, Economic surveys, Economic factors, Manpower, Shortages, Hungary, Prefabrication, Reinforced concrete, Planning, Design criteria, Technology transfer.

The need of developing countries for developing the industrial construction sector and obtaining technical assistance to achieve this objective in the fastest and most effective way is a well-known fact. Though there is a big variety in the conditions of various developing countries in different parts of the world, certain common factors appear in almost all cases. Many of these factors were characteristic for Hungary in the past three decades, and it can be helpful to see what could be used from the Hungarian experience in this field.

PB-255 137/2 PC A03/MF A01
Environmental Protection Agency, College, Alaska. Arctic Environmental Research Lab.
Alaska Village Demonstration Projects: First Generation of Integrated Utilities for Remote Communities
Oct 73, 36p Rept no. Working Paper-22

Descriptors: *Alaska, *Sanitary engineering, Rural areas, Waste water, Sewage disposal, Potable water, Sewage treatment, Regional planning.

The report describes the Alaska Village Demonstration Project which was authorized by Congress in 1970 to demonstrate methods of providing safe water supplies, toilets, bathing and laundry facilities, sewage disposal, and other similar facilities for remote Alaskan communities.

SELECTED APPROPRIATE TECHNOLOGIES

- PB-255 444/2** PC A04/MF A01
 Dana Larson Roubal and Associates, Pierre, S. Dak.
Irrigation Feasibility Study - Crow Creek Tribal Farm, Crow Creek Reservation, South Dakota
 Engineering rept. 1976.
 May 76, 55p
 Grant EDA-05-06-01566
 Prepared in cooperation with Crow Creek Sioux Tribal Council, Fort Thompson, S. Dak.
- Descriptors: *Irrigation, *Economic development, Soil properties, Climate, Water quality, Farm crops, American Indians, Technical assistance, Feasibility, Cost estimates, Recommendations, South Dakota.
 Identifiers: Indian reservations, Sioux Indians.
- The purpose of the study is to investigate and recommend whether irrigation should be used on the Tribal Farm of the Crow Creek Sioux Reservation. Geographical conditions, various proposed irrigation methods, cropping systems, and project phasing are presented for consideration. Estimated project costs are given and final recommendations made.
- PB-255 447/5** PC A10/MF A01
 Smithsonian Institution, Washington, D.C. Office of International and Environmental Programs.
Coastal Zone Pollution in Indonesia - A Renaissance Survey
 Apr 74, 203p
 Contract AID/csd-2608
- Descriptors: *Water pollution, *Oil pollution, *Coasts, *Indonesia, Developing countries, Ocean environments, Ecology, Fisheries, Estuaries, Harbors, Vulnerability, Sedimentation, Pesticides, Industrial wastes, Sewage, Dredging.
 Identifiers: *Oil spills, Offshore drilling.
- A number of catastrophic marine oil spills in the 1960's and in 1970 alerted the world to the hazards and impacts of marine oil pollution. In the same period, the emergence of other serious kinds of pollution sparked pollution control initiatives in many countries of the world. Environmental impacts associated with international development led to the undertaking of the present joint study on oil and other pollution in Indonesia's coastal waters. A survey was made of the impact of offshore oil exploitation.
- PB-255 605/8** PC A12/MF A01
 Colorado State Univ., Fort Collins. Cooperative Extension Service.
Pesticide Chemicals. A Programmed Text
 Max R. Uhlemann, Donald E. Moss, Charles O. Neidt, and Philip C. Minter. Apr 72, 261p
- Descriptors: *Pesticides, *Agriculture, Books, History, Weed control, Herbicides, Plant diseases, Insects, Mites, Acaricides, Chlordane, Dieldrin, Livestock, Parasites, Chlorobenzenes, Questionnaires, Toxicity, DDT, Chlorohydrocarbons, Aldrin.
- Contents:
 Weeds;
 Plant disease, Insects and mites of agricultural importance;
 Insecticides and miticides;
 Livestock pests.
- PB-255 649/6** PC A05/MF A01
 International Planning Management Corp., Bethesda, Md.
Small Business in the Metals Industry: A Background Study
 Final rept.
 24 May 76, 88p NSF/RA-76017
 Contract NSF-Order-76-SP-0871
- Descriptors: *Mental industry, *Businesses, *Economic surveys, Extractive metallurgy, Technology innovation, Management planning, Marketing, Reviews, Data acquisition, District of Columbia, Government policies, Commodity management, Metaliferous ores, Mining, Beneficiation, Raw materials, Foundries, Materials recovery, Solid waste disposal.
- Identifiers: Waste recycling, High technology industries, Service companies, Secondary materials industry, Small businesses.
- The objective of this study is to identify the principal small business roles in, and innovations of particular importance to, the metallurgical industry, together with associated planning and policy issues, marketing issues, and institutional arrangements. The scope of this study is confined primarily to the extraction and processing phases of the metals cycle. Extraction includes all stages prior to metal processing: mining, beneficiation of ores, reduction, smelting, and refining of the pure metals. Processing includes alloying, heat treating, rolling, casting, and fabrication. The role of small business in metals recycling and substitution is also considered but with less emphasis. The approach of the study combines literature review and letters of inquiry with personal interviews in the Washington, D.C. area. Three broad areas were identified in which small business is actively involved: high technology, service companies, and secondary recovery. A list of the individuals and institutions contacted is included in Appendix A, and a selected bibliography in Appendix B.
- PB-255 716/3** PC A05/MF A01
 Nevada Univ., Reno. Desert Research Inst.
Quality of Water Considerations in Arid Area Water Management
 Hydrology and water resources technical rept.
 G. F. Cochran, D. Fitzsimmons, J. Garrett, and G. S. Watson. Dec 73, 94p H-W-Pub-16, OWRT-C-2152(3371-1)
- Descriptors: *Water quality management, *Arid land, *Las Vegas Valley, Water supply, Surface waters, Ground water recharge, Water consumption, Water reclamation, Cost analysis, Policies, Mathematical models, Water conservation, Tables(Data), Nevada.
 Identifiers: *Water management(Applied), Artificial recharge.
- The report is the third in a series of four to be published on a study entitled, 'Research and Analysis to Plan, Develop, and Manage a Ground and Surface Water Supply'. The area considered is the Las Vegas Valley in southern Nevada where a ground- and surface-water supply system has been developed. This report focuses on (1) water quality considerations as they pertain to water supplied for domestic, industrial and municipal uses from resources of different quality and quantity; (2) laws and institutions which play an active role in all aspects of water quality, such as primary water use, reclaimed water use, artificial ground-water recharge and control of once used water and its discharge; (3) potential uses, values and costs of reclaimed water after various levels of treatment, (4) continued extension and refinement of the master water resource model for the area; and (5) examination of the effects of water quality constraints and objectives on 'optimal' water use policies as determined with the master water resource model.
- PB-255 911/0** PC A05/MF A01
 Transportation Research Board, Washington, D.C.
Transportation and Land Use Planning Abroad
 Special rept.
 Floyd I. Thiel, Teruki Kitamura, Yasumasa Torii, Allan K. Sloan, and Daniel L'Huillier. 1976, 83p*
 Rept nos. TRB/SR-168, ISBN-0-309-02487-0
- Descriptors: *Transportation, *Land use, *Foreign countries, Noise reduction, Noise pollution, Financing, Public opinion, Pedestrians, Highway transportation, Urban transportation, Cargo transportation, Japan, Canada, Europe, Middle East, Developing countries, Metropolitan areas.
- The papers discuss some of the ways that transportation and land use planning abroad is providing experience that can be helpful in the United States. Geographic areas from which experience is drawn include Japan, Canada, Europe, and the Middle East. Topics include noise and other transportation impacts, land use techniques to deal with these impacts, transit financing, public participation, 'pedestrianization' in various countries, pricing to restrain parking, truck regulation, highway
- needs in Canada, and transportation sensitivity considerations in developing countries.
- PB-256 103/3** PC A02
 Rhode Island Univ., Kingston. Dept. of Resource Economics.
Optimizing the Growth and Marketing of Fish in a Controlled Environment
 J. M. Gates, and J. J. Mueller. Jun 75, 7p Marine Print-52, NOAA-76050601
 Grant NOAA-04-3-158-3, NOAA-04-5-158-6
 Pub. in MTS Jnl., v9 n5 p13-16 Jun 75. Also pub. as Rhode Island Agricultural Experiment Station, Contrib-1611.
- Descriptors: *Fisheries, *Aquaculture, *Economic development, Marine fishes, Fishes, Marketing, Prices, Salmon, Growth, Sales, Optimization, Pumping, Feasibility, Heating, Operating costs, Mathematical models, Temperature, Controlled atmospheres, Linear programming, Tables(Data).
 Identifiers: Reprints, Sea Grant program.
- The report assesses the economic feasibility of optimizing the growth and marketing of fish in a controlled environment. This report presents a linear programming model in which processes are included for sales, growth, water pumping, and recruitment.
- PB-256 128/0** PC A06/MF A01
 Development Planning and Research Associates, Inc., Manhattan, Kans.
Feasibility Study of a Fish Processing Plant at Kotzebue, Alaska
 Technical assistance rept.
 Jun 75, 102p EDA-76-025
 Contract C-4-36315
- Descriptors: *Food processing, *Fishes, *Economic development, Salmon, Marine fishes, Technical assistance, Feasibility, Economic impact, Market research, Alaska, Cash flow.
 Identifiers: Kotzebue(Alaska), Fish processing.
- The purpose of the report was to evaluate the economic and technical feasibility of replacing the present fish processing plant with a new facility at Kotzebue, Alaska. In the past three years, the Cooperative had to consider replacing the plant which was deteriorating. The economic impact of a new processing plant would be significant, therefore creating more jobs and an increased cash flow.
- PB-256 357/5** PC A03/MF A01
 Environmental Protection Agency, Cincinnati, Ohio. Solid Waste Research.
Studies of Small Particles in Solid Waste Operations
 Open-file progress rept.
 Nancy S. Ulmer. 1971, 38p Rept no. SWR-102
- Descriptors: *Solid waste disposal, *Size determination, *Particle size distribution, Commutation, Incinerators, Refuse disposal, Composts, Residues, Fly ash, Measuring instruments, Microscopes, Optical measuring instruments, Dimensional measurement, Drying, Experimental design, Standards, Classification, Materials recovery, Air pollution.
- The installation of a Small Particle Studies Laboratory and the familiarization with the principles, techniques, and instrumentation of industrial microscopy and Coulter Counter technology are described. The development evaluation, and utilization of procedures for preparing a library of solid waste samples, permanent sample mounts, and photomicrographs are reviewed. A tentative classification or identification of typical particles in six solid waste samples is reported. Additional investigations, designed to develop and evaluate procedures for determining the particle size distribution of incinerator fly ash samples and for identifying and estimating specific components of particular significance in the management or recovery of solid wastes are proposed.
- PB-256 406/0** PC A04/MF A01
 United Indian Tribe of Western Oklahoma and Kansas.

SELECTED APPROPRIATE TECHNOLOGIES

Hog Bristle Processing By-Products and Paint Brush Manufacturing. A Feasibility Report

1976, 67p EDA-76-022
Grant EDA-08-601573-1

Prepared by General Research Corp., Oklahoma City, Okla.

Descriptors: *Economic development, *Technical assistance, *Manufacturing, *Brushes, Paint applicators, Bristles, Marketing, Product development, Revenue, Profits, Operating expenses, Oklahoma, Kansas.

Identifiers: Hog bristles.

The report investigates the potential for the manufacture of natural bristle paint brushes and the potential for marketing bristle byproducts. The report also examines both the purchases of bristle on the open market and the use of bristle supplied by processing operations.

PB-256 460/7 PC A03/MF A01
Environmental Protection Agency, Washington, D.C. Resource Recovery Div.
Resource Recovery Plant Implementation: Guidelines for Municipal Officials: Further Assistance
1975, 34p Rept no. EPA-SW-157.8

Descriptors: *Economic development, *Urban planning, *Materials recovery, Resources, Project planning, Industrial plants, States(United States), Community development, Systems engineering, Organizations, Economic assistance, Manuals, Technology innovation, Reclamation, Municipalities, Solid waste disposal.
Identifiers: Solid waste management.

This publication is part of a special series of reports prepared by the U.S. Environmental Protection Agency's office of solid waste management programs. These reports are designed to assist municipal officials in the planning and implementation of processing plants to recover resources from mixed municipal solid waste. It deals with planning and management.

PB-256 461/5 PC A02/MF A01
Environmental Protection Agency, Washington, D.C. Resource Recovery Div.
Resource Recovery Plant Implementation: Guidelines for Municipal Officials: Financing
1975, 25p Rept no. EPA-157.4

Descriptors: *Economic development, *Materials recovery, *Financing, Management planning, Decision making, Cost engineering, Capital, Solid waste disposal, Reclamation, Urban planning, Marketing, State government, Local government, National government, Government policies.
Identifiers: Solid waste management.

This publication is part of a special series of reports designed to assist municipal officials in the planning and implementation of processing plants to recover resources from mixed municipal solid waste. It deals with financing, decision making, cost engineering, and capital formation.

PB-256 771/7 PC A03/MF A01
Bangladesh Univ. of Engineering and Technology, Dacca. Dept. of Civil Engineering.
Low-Rise Low-Cost Housing and Extreme Wind Related Problems In Bangladesh
Rept. no. 2
Jamilur R. Choudhury. Apr 75, 40p NBS-GCR-76-74
Contract NBS-4-35770

Descriptors: *Housing planning, *Bangladesh, Residential buildings, Socioeconomic status, Urban areas, Rural areas, Surveys, Requirements, Wind(Meteorology), Damage, Records, Foreign countries.
Identifiers: Wind damage, Low cost housing, Low rise buildings.

This report furnishes information on socio-economic factors, the present conditions of urban and rural housing, and housing needs in Bangladesh for the next ten years. It also provides data on available wind speed records and wind damage

statistics and discusses some special problems unique to Bangladesh.

PB-257 357/4 PC A13/MF A01
National Research Council, Washington, D.C. Committee on Renewable Resources for Industrial Materials.
Renewable Resources for Industrial Materials
James S. Bethel. Sep 76, 280p* NSF/PRA-1 Contract NSF-STP75-01069

Descriptors: *Natural resources, *Forestry, *Agriculture, *Energy conservation, Wood products, Farm crops, Cotton plants, Soybean plants, Elastomers, Leather, Hides, Algae, Fishes, Solid wastes, Refuse, Biomass, Textiles, Paper products, Paperboards, Farm management, Production management, Supply management, Energy management, Substitution.

Identifiers: Renewable resources, Fuel substitution.

The concept of the Reference Materials System (RMS) is used as a framework for material assessment and, more specifically, to address the substitution of renewable materials for nonrenewables in particular end uses. The orderly and rational development of national goals for renewable resources requires the evaluation of alternative materials supply systems in terms of resource supply; available technology; and energy, manpower, and capital requirements.

PB-257 358/2 PC A04/MF A01
New York State Coll. of Agriculture and Life Sciences, Ithaca.
Potential Increases In Food Supply Through Research In Agriculture. Constraints on Increasing Agricultural Production in the Tropics. Research and Implementation Needs
Final rept.
Edwin B. Oyer, Charles E. Hanrahan, Glenn H. Beck, J. Ritchie Cowan, and H. David Thurston. 31 May 76, 57p* NSF/PRA-4 Contract NSF-STP75-13988

Descriptors: *Agriculture, *Tropical regions, *Food supply, *Research projects, Universities, Farms, Technology transfer, Soils, Natural resources, Plant growth, Inventories, Constraints, Water supply, Fertilizers, Seeds, Pesticides, Feeding stuffs, Animal diseases, Production.
Identifiers: Tropical agriculture.

The report centers on researchable constraints which can be addressed immediately and, with reasonable inputs, be expected to produce production-increasing results in 5-10 yrs. Enhancement of prospects for technological innovation employing a described global network of agricultural research institutions is suggested. Techniques which will foster farmer-researcher participation in planned and structured research on farming systems of the tropics are called for as a means of increasing food production. Enhancement of efforts in the following areas are recommended: (1) evaluation and utilization of available germplasm in cropping systems, (2) inventory of soil resources and determination of amendments needed to produce adapted plants, (3) improvement of water and pest management practices and seed technology, and (4) utilization of ruminant animals in farming systems with attention to feed supplies, protection from diseases and increased productivity of the animals.

PB-257 404/4 PC A05/MF A01
Connecticut Resources Recovery Authority, Hartford.
Front End Recycling: A Study of the Economics of Recycling by Source Separation and Its Application for Fairfield County, Connecticut
Ronald Fattibene, and Irving Moy. Jun 76, 94p EDA-76-043
Prepared by Action for Bridgeport Community Development, Inc., Bridgeport, Conn.

Descriptors: *Solid waste disposal, *Materials recovery, *Separation, Management planning, Feasibility, Economic analysis, Glass, Cans, Tin coatings, Steels, Metal scrap, Aluminum, Newsprint, Questionnaires, Personnel, Connecticut.

Identifiers: *Waste recycling, Secondary materials industry.

A one-year grant from the EDA to the Connecticut Resources Recovery Authority was allocated to the CRRA to examine the economics of recycling by source separation in Fairfield County. The purposes of the project was to assess the feasibility of a technology system for recycling by source separation and to determine the practicability of instituting such a system and the resulting economic impact of such an enterprise in Fairfield County. Factors to be explored in the course of the study were creation of new jobs, new business, cost benefits from the sale of recycled materials, and cost savings to communities. Conclusions and recommendations reflect the system as it existed at this writing.

PB-257 454/9 PC A05/MF A01
Environmental Protection Agency, Washington, D.C. Municipal Construction Div.
Land Application of Wastewater in Australia. The Werribee Farm System, Melbourne, Victoria
Technical rept.
Belford L. Seabrook. May 75, 88p Rept nos. EPA/430/9-75/017, EPA/MCD-16

Descriptors: *Sewage treatment, *Irrigation, *Farms, *Municipalities, Soil properties, Land use, Rainfall, Arid land, Operating costs, Fertilizing, Waste water, Australia.
Identifiers: *Flood irrigation, *Sewage irrigation, Werribee Farm, Melbourne(Australia).

The report concerns the Werribee Farm soil treatment area operated by the Melbourne and Metropolitan Board of Works (MMBW). The Board (MMBW) was constituted in 1890 by an Act of the Parliament of Victoria to develop and operate a system of main and general sewerage for the metropolis. James Mansergh, an eminent sanitation engineer from London, submitted eight alternative schemes, five of which involved treatment by land. Mansergh stated that the Werribee site was situated for land purification of sewage because it was exceptionally dry and had an abnormally low rainfall compared with surrounding districts. His recommendation, based on proven success in England, and on the benefit of irrigation in an area of low rainfall, was for disposal by flood irrigation on prepared land without prior treatment of the sewage. Even today raw sewage is used at the Werribee Farm. The Werribee Farm soil treatment system is the outstanding project in Australia from the standpoints of the lowest annual operating costs, success, size and extent of experience with the use of wastewater effluents.

PB-257 560/3 PC A04/MF A01
Arizona Univ., Tucson. Office of Arid Lands Studies.
Continuation of the Arizona Water Information System (AWIS)
Technical completion rept.
K. E. Foster, and K. J. DeCook. 1975, 55p OWRT-A-031-ARIZ(2)
Contract DI-14-31-0001-5003
Prepared in cooperation with Arizona Water Resources Research Center.

Descriptors: *Water resources, *Information retrieval, *Data processing, *Information systems, Hydrologic cycle, Ground water, Water quality, Systems analysis, Water supply, Data storage, Project planning, Abstracts, Regional planning, Colorado River Basin, Arizona, California, Nevada.
Identifiers: Hydrologic data.

The Arizona Water Information System (AWIS) was developed for storage and retrieval of water resources data and for dissemination of water resources information pertaining to the state of Ariz. Collectively, the AWIS system contains a number of distinct elements. The Activity File is a listing of water resource activities and projects dating from 1961, which can be accessed by keywords or by agency to retrieve abstracts and information on approximately 1,000 projects; the file recently was updated and additional projects covered in a regional program pertaining to the Lower Colo. River Basin portions of Ariz., Calif., and Nev.

SELECTED APPROPRIATE TECHNOLOGIES

PB-257 649/4 PC A03/MF A01
 Environmental Protection Agency, Washington, D.C. Municipal Construction Div.
Model Facility Plan for a Small Community, Supplement to: Guidance for Preparing a Facility Plan, Municipal Wastewater Treatment Works Construction Grants Program
 Sep 75, 45p Rept no. EPA/MCD-08

Descriptors: *Sewage treatment, *Municipalities, *Project planning, *Facilities, *Construction, Models, Grants, Federal assistance programs, Handbooks, Guidelines, Public utilities.

Identifiers: Hypothetical communities, Application making, Federal Water Pollution Control Act Amendments of 1972.

Under the Federal Water Pollution Control Act Amendments of 1972, a municipality must prepare a facility plan as part of its Step 2 grant application for the construction of a wastewater treatment works. This model plan for a fictitious small, rural community supplements the Guidance for Preparing a Facility Plan, published in May 1975. The plan is provided for illustrative purposes only and should not be read as an ironclad guide to facility planning for small, rural communities.

PB-257 801/1 PC A05/MF A01
 Environmental Protection Agency, Washington, D.C. Office of Solid Waste Management Programs.
Improving Rural Solid Waste Management Practices
 Theodore L. Goldberg. 1973, 91p Rept no. EPA-SW-107

Descriptors: *Solid waste disposal, *Rural areas, *Management methods, Technology, Improvement, Recommendations, Effectiveness, Environmental surveys, Collecting methods, Processing, Storage, Organizing, Objectives, Transferring, Sanitary landfills, Equipment, Financing, Citizen participation.

Identifiers: Household wastes.

This report surveys what has been done and can be done to raise the quality of solid waste management in rural America through existing technology. The aspects covered include planning for solid waste management; types of collection, processing, and disposal methods; means of financing systems; and citizen support. Although the priority in the report deals with handling wastes from rural residences, any methods discussed can be incorporated into handling commercial, industrial, or institutional wastes in rural counties and communities. Two problem wastes--agricultural wastes and abandoned vehicles--are not covered.

PB-258 003/3 PC E02/MF A01
 Illinois Univ. at Chicago Circle. Dept. of Materials Engineering.
Cracking and Leakage Characteristics of Ferrocement Water Tanks
 Interim rept.
 Antonio J. Guerra, Antoine E. Naaman, and Surendra P. Shah. Sep 76, 62 Rept no. 76-3
 Contract NSF-ENG74-20829

Descriptors: *Water tanks, Mortars(Material), Portland cements, Reinforcing materials, Wire cloth, Cracking(Fracturing), Leakage, Cost comparison, Cylindrical bodies, Structural analysis.

Identifiers: *Ferrocement.

Cylindrical ferrocement tanks were subjected to increasing internal water pressures to study the influence of the reinforcing parameters on their cracking and leakage behavior. Based on the information generated in this investigation, allowable tensile stresses of about 30,000 psi in the steel are recommended for the design of virtually watertight ferrocement tanks. This allowable stress - which is almost twice higher than that recommended by the ACI Committee on reinforced concrete sanitary engineering structures - is used in a cost comparison study of water tanks made with ferrocement, reinforced concrete and steel. It is found that for current U.S. prices, properly dimensioned and designed ferrocement water tanks of up to 300,000 gallon capacity are cost competitive with reinforced concrete and steel tanks and would have at least equal performance.

PB-258 068/6 PC A03/MF A01
 Environmental Protection Agency, Washington, D.C. Div. of Water Planning.
Implementing 'Best Management Practices' for Residues: The Waste Exchange
 Alan K. Vilberg, Michael L. Rucker, and Christopher H. Porter. Jun 76, 31p Rept no. EPA/440/9-76/019

Descriptors: *Materials recovery, *Benefit cost analysis, *Utilization, Exchanging, Economic development, Residues, Solid waste disposal, Technology, Salvage, Water pollution abatement, Incentives, Industrial wastes.

Identifiers: State planning.

This document presents an overview of a mechanism which can be used to facilitate the exchange of wastes, as is, from a generator to a user and its possible role in state and areawide residuals planning efforts. The premise is that many wastes contain valuable materials, some of which are in short supply. Extraction of materials from these wastes makes sense from both the conservation and the environmental points of view. Industry can dispose of its unwanted wastes and perhaps receive a monetary bonus. The waste receiver can potentially reduce costs for materials. In addition, the environment is saved from the introduction of potential pollutants from land and water disposal methods.

PB-258 402/7 PC A08/MF A01
 Environmental Protection Agency, Washington, D.C. Office of Water Programs.
Manual of Individual Water Supply Systems
 1975, 160p Rept no. EPA/430/9-74/007
 See also PB-215 815, and PB-258 403.

Descriptors: *Water supply, *Water distribution, *Water consumption, Manuals, Ground water, Sources, Surface waters, Rural areas, Water storage, Pumping, Water wells, Bacteria, Water quality, Disinfection, Ordinances.

Identifiers: *Water quality data.

Contents:
 Selection of a water source;
 Ground water;
 Surface water for rural use;
 Water treatment;
 Pumping, distribution, and storage.

PB-258 403/5 PC A08/MF A01
 Environmental Protection Agency, Washington, D.C. Office of Water Programs.
Manual of Individual Water Supply Systems
 1973, 159p Rept no. EPA/430/9-73/003
 See also PB-215 815, and PB-258 402.

Descriptors: *Water supply, *Water distribution, *Water consumption, Manuals, Sources, Ground water, Surface waters, Rural areas, Water storage, Pumping, Water treatment, Water wells, Bacteria, Water quality, Disinfection, Ordinances.

Identifiers: *Water quality data.

Contents:
 Selection of a water source;
 Ground water;
 Surface water for rural use;
 Water treatment;
 Pumping, distribution, and storage.

PB-258 499/3 PC A05/MF A01
 Ebon Research Systems, Silver Springs, Md.
Fuel and Energy Production by Bioconversion of Waste Materials - State-of-the-Art
 Silvia A. Ware. Aug 76, 78p* EPA/600/2-76/148
 Contract EPA-68-03-0295

Descriptors: *Synthetic fuels, *Solid waste disposal, *Energy sources, *Reclamation, Refuse, Organic wastes, Agricultural wastes, Wood wastes, Solid wastes, Biomass, Fertilizers, Wastes, Cellulose, Methane, Ethyl alcohol, Ethanol, Methyl alcohol, Fuel oils, Char, Anaerobic processes, Hydrolysis, Fermentation, Digestion(Decomposition), Cost estimates, Technology, Reviewing.

Identifiers: Manure, Animal wastes, *Refused derived fuels.

This report is a state-of-the-art summary of biological processes for converting waste cellulosic materials (agricultural, municipal and lumbering wastes) to fuels. It indicates the locations and quantities of suitable wastes and discusses the status of the current processing schemes. The processes discussed are: Acid hydrolysis followed by fermentation; enzyme hydrolysis followed by fermentation; anaerobic digestion of manure and municipal solid waste; and, biophotolysis.

PB-258 742/6 PC A08/MF A01
 Industrial Environmental Research Lab., Cincinnati, Ohio. Food and Wood Products Branch.
Workshop on In-Plant Waste Reduction in the Meat Industry, Held at University of Wisconsin, Madison, December 13-14, 1973
 Final rept.
 Jack L. Withrow, and James F. Scaief. Sep 76, 151p Rept no. EPA/600/2-76/214

Descriptors: *Water conservation, *Waste water reuse, *Meat, *Food processing, *Meetings, Animals, Blood, Curing, Brines, Hair, Cleaning, Industrial wastes, Byproducts, Packing(Packaging), Beef cattle, Industrial plants, Removal, Reduction, Water pollution control, Livestock, Waste disposal. Identifiers: *Meat industry, Slaughtering house wastes, Rendering plants, Slaughtering pens, Feedlot wastes, Offal wastes, Paunch.

Presented are the proceedings of a workshop on in-plant waste reduction in the meat industry. Forty-five participants from industry, government, and private firms exchanged ideas and experiences on waste reduction during the two-day session. Topics covered were: pens, blood conservation and processing, paunch and viscera handling, rendering and plant clean-up operations. Case histories are presented on water conservation in a meat packing plant and in a hog processing plant.

PB-259 318/4 PC A08/MF A01
 Institute of Gas Technology, Chicago, Ill.
Wind-Powered Hydrogen Electric Systems for Farm and Rural Use
 Final rept. May-Dec 75
 Raymond R. Tison, Nicholas P. Biederman, Timothy Donakowski, Robert H. Elkins, and Jon B. Pangborn. Apr 76, 171p ERDA/NSF-00772/75/1
 Grant NSF-AER75-00772

Descriptors: *Wind power generation, *Systems analysis, Systems engineering, Farms, Rural areas, Electric power consumption, Electric power demand, Electrochemical power generation, Storage batteries, Hydrogen-based energy, Fuel cells, Electrolysis, Hydrogen, Inverters, Energy storage, Computerized simulation, Computer programs, FORTRAN.

Preliminary designs for wind-energy conversion systems supplying the total energy needs of selected farms and a rural home are synthesized. The concept is a fully dedicated system whose components and subsystems are off-the-shelf technology. The principal subsystems and components are: (1) input (wind turbine, electrolyzer, and rectifiers); (2) storage (batteries, and storage tanks of hydrogen and hot water); and (3) output (inverter, motor generator, engine generator, and fuel cell). Two methods of energy storage are evaluated for use and subsequently form the bases upon which each design is optimized. It is shown that wind-energy systems based on battery-storage systems are: (1) simpler to construct and maintain; (2) more efficient; and (3) less expensive than those based on hydrogen-storage systems. Further, the relative economics of each wind-energy system are heavily dependent on wind availability, number of days of energy storage required, and the match between the wind energy available and the energy requirement of the load. Of all the energy requirements characterized, the cash grain operation is shown to be the least adaptable to wind-energy systems.

PB-259 512/2 PC A07/MF A01
 Iowa State Univ., Ames.

SELECTED APPROPRIATE TECHNOLOGIES

Estimating Staffing and Cost Factors for Small Wastewater Treatment Plants Less Than 1 MGD. Part I. Staffing Guidelines for Conventional Municipal Wastewater Treatment Plants Less Than 1 MGD

E. Robert Baumann, Keith L. McRoberts, and C. E. Smith. Jun 73, 133p
Grant EPA-5P2-WP-195-0452
Also available in set of 2 reports as PB-259 511-SET, PC E99/MF E99.

Descriptors: *Sewage treatment, *Municipalities, *Manpower, Objectives, Specifications, Effectiveness, Personnel development, Cost analysis, Job analysis.

This study is one of many which has as its primary objective improved wastewater treatment. In the area of water pollution control, proper wastewater treatment is one such control measure. One mechanism for good control is to insure that new and existing treatment plants are operated by adequate numbers of well-trained staff. This report describes the objectives, manpower planning, and management for treatment plants.

PB-259 513/0 PC A06/MF A01

Iowa State Univ., Ames.

Estimating Staffing and Cost Factors for Small Wastewater Treatment Plants Less Than 1 MGD. Part II. Estimating Costs of Package Wastewater Treatment Plants

George E. Lamp, Jr. E. Robert Baumann, Keith L. McRoberts, and C. E. Smith. Jun 73, 106p
Grant EPA-5P2-WP-195-0452
Also available in set of 2 reports as PB-259 511-SET, PC E99/MF E99.

Descriptors: *Sewage treatment, *Cost analysis, Municipalities, Industrial plants, Classifications, Operating costs, Cost engineering, Manufacturers, Estimates, Tables(Data), Capitalized costs, Regression analysis.

Effective and efficient wastewater treatment is a function of both the quality of treatment and the cost of treatment. Although the actual quality and cost of treatment cannot be known until after a plant is in operation, estimates of both are needed at various times during the process of planning and designing a wastewater treatment system. The report describes costs, cost factors, data from manufacturers, and operating package plants.

PB-259 531/2 PC A06/MF A01
DeLeuw, Cather and Co., San Francisco, Calif.
Safety and Locational Criteria for Bicycle Facilities. User Manual. Volume I: Bicycle Facility Location Criteria

Final rept.
D. T. Smith, Jr. Feb 76, 102p* FHWA/RD-75-113
Contract DOT-FH-11-8132

Descriptors: *Bicycles, *Roads, *Manuals, Sites, Criteria, Vehicular traffic, Planning, Facilities, Traffic safety.
Identifiers: *Bikeways, *Bikeway planning.

The manual is designed to enable users to make judgments on the need for and the location and form of bicycle facilities. The document offers an overview of the planning process and relevant locational criteria. In addition, a methodology for estimating potential bicycle activity is presented. An appendix which discusses the use of surveys in locational planning has also been included. Finally, a design solution for the provision of bikeway grades based upon a consideration of physiological work capability is described.

PB-259 545/2 PC A12/MF A01
De Leuw, Cather and Co., San Francisco, Calif.
Safety and Location Criteria for Bicycle Facilities

Final rept.
Daniel T. Smith, Jr. Feb 76, 254p* FHWA/RD-75-112
Contract DOT-FH-11-8134
Prepared in cooperation with California Univ., Davis, and Bicycle Research Associates, Davis, Calif.

Descriptors: *Bicycles, *Roads, *Safety, Sites, Planning, Criteria, Research, Communities, Routes, Vehicular traffic, Traffic safety.
Identifiers: *Bikeways, *Bikeway planning.

The purpose of the Safety and Locational Criteria for Bicycle Facilities research project is to improve the quality and consistency of bicycle facility planning and design. This report is a compendium of all research activities undertaken during the program. User oriented versions of research findings are presented in two companion manuals. Volume I deals with design, focusing on the process and details of laying out the physical features of bikeway facilities. Volume II deals with locational criteria for bicycle facilities and the process of systematic planning for bicycle facilities in a community. These user volumes expand upon an earlier interim product of the program, the FHWA report Bikeways -- State-of-the-Art -- 1974. However, most of the information in that report remains relevant.

PB-259 964/5 PC A05/MF A01

Corvallis Environmental Research Lab., College, Alaska. Arctic Environmental Research Station.
Water Utilization for Small Communities In Rural Alaska

Interim rept. Jul 73-Jun 76
Bertold Puchtler, Barry Reid, and Conrad Christianson. Sep 76, 84p Rept no. EPA/600/3-76/104

Descriptors: *Sewage treatment, *Water supply, *Arctic regions, *Sanitary engineering, Rural areas, Toilet facilities, Laundries, Sewage disposal, Operating costs, Maintenance, Public utilities, Standards, Alaska.
Identifiers: Eskimos, Tertiary treatment.

The 'Alaska Village Demonstration Projects' were authorized by Section 113, P.O. 92-500 (86 STAT 816), for the purpose of demonstrating methods to improve sanitary conditions in native villages of Alaska. Central community facilities have been constructed in the native villages of Emmonak and Wainwright to provide a safe water supply; toilets, bathing and laundry facilities, and sewage and waste disposal. The idea of coming to a community center to secure water, to do the laundry, and to bathe has proven acceptable to the people of Wainwright and Emmonak. However, Alaskan native villages generally can not pay, through service charges, the full cost of routine operation and maintenance of water-related utilities, especially where complex treatment is required to meet waste treatment standards. The physical-chemical wastewater treatment provided required considerable modification and detailed operator attention to provide consistent secondary treatment.

PB-259 990/0 PC A04/MF A01

Agricultural Research Council, Khartoum (Sudan).
Report of a Workshop on Aquatic Weed Management: Some Prospects for the Sudan and the Nile Basin, Held at Khartoum, Sudan on 24-29 November 1975

1975, 65p
Contract AID/csd-2584

Descriptors: *Aquatic weeds, *Weed control, *Meetings, *Developing countries, Management, Rivers, Lakes, Canals, Recommendations, Utilization, Nile River Basin, Africa.
Identifiers: *Water hyacinths, *Sudan Region(Africa).

This is a report of a workshop on the management and utilization of aquatic weeds in the Sudan and the Nile Basin. The workshop, held November 24-29, 1975, formulated recommendations addressed to one of the most critical environmental problems of the region—the weeds that infest the rivers, swamps, lakes and canals. The report addresses both the water hyacinth problem and the problems of canal weeds, most of which are submerged and not readily seen, but which can render canals useless by blocking the water flow. It is written for administrators and scientists in all the countries of the greater Nile watershed and basin, but focuses particularly on the Sudan as a model case for the region.

PB-260 051/8 PC A03/MF A01
Massachusetts Inst. of Tech., Cambridge
Contributions from the Sanitary Research Laboratory and Sewage Experiment Station. Volume X. Studies on the Digestion of a Sewage-Filter Effluent by a Small and Otherwise Unpolluted Stream

Report dated 1 Jul 14-1 Jul 16
Robert Spur Weston, and C. E. Turner. 1917, 50p
Sponsored in part by Public Health Service, Washington, D. C. Portions of this document are not fully legible.

Descriptors: *Sewage flow rate, *Sewage treatment effluent, Sewage bacteria, Sewage disposal, Water pollution, Stream flow, Stream pollution, Waste disposal.

Results are presented of a 2-year study to determine to what extent a stream, lake, or estuary will receive and digest the effluents from sewage purification plants. Emphasis is on the biological aspects. Data indicates that slowly moving water is able to digest and highly purify effluents in large volume with the first three-fourths of a mile. The process of digestion is almost wholly biological and is extremely sensitive to conditions such as temperature, rainfall, and the amount and character of plant and animal life.

PB-260 606/9 PC A14/MF A01
National Academy of Sciences, Washington, D.C.
Energy for Rural Development: Renewable Resources and Alternative Technologies for Developing Countries

1976, 306p*

Contract AID/csd-2584

Descriptors: *Developing countries, *Rural areas, *Regional planning, *Energy sources, Solar energy conversion, Wind power, Windpower utilization, Hydroelectric power, Photosynthesis, Geothermal energy conversion, Energy storage, Reviews, Reviewing.
Identifiers: Biological energy conversion.

This report provides a summary of the state of the art of alternative technologies frequently suggested as solutions to rural or individual-family energy needs. Moreover, it informs both the technologist and the planner where to go for more detailed information and what kinds of research and development are needed before a particular device or process is ready for use.

PB-260 633/3 PC A04/MF A01
Illinois Dept. of Business and Economic Development, Springfield. Div. of Energy.
Energy Recovery from Solid Waste: A Review of Current Technology

Final rept.
Dugald O. Black. Jul 76, 68p* NSF/DOE-76-05

Descriptors: *Energy sources, *Solid waste disposal, *Reclamation, *Refuse disposal, Pyrolysis, Incinerators, Biodegradation, Design, Technology, Cost analysis, Reviews.
Identifiers: Incineration.

This report was written to aid a community in selecting an energy recovery solid waste disposal system that best fits their needs. The choice of an appropriate conversion process for energy recovery is highly sensitive to each local situation. A critical factor to be considered in the selection of any conversion process is the economic aspect of each system. A discussion of the economic factors and the relative advantages and disadvantages of each process is included.

PB-260 763/8 PC A08/MF A01
Stanford Research Inst., Menlo Park, Calif.
An Evaluation of the Use of Agricultural Residues as an Energy Feedstock. Volume I

J. A. Alich, Jr., R. E. Inman, and K. Ernest. Jul 76, 164p* NSF/RANN/SE/GI-18615/FR/76/3, NSF/RA-760286
Grant NSF-AER74-18615-A03
See also Volume 2, PB-260 764. Continuation of Grant NSF-GI-18615.

SELECTED APPROPRIATE TECHNOLOGIES

Descriptors: *Agricultural wastes, *Energy sources, *Waste utilization, *Organic wastes, Farm crops, Fertilizers, Wastes, Forest trees, Trees(Plants), Bark, Wood, Plant residues(Organic), Waste management, Materials recovery, Electric power generation, Manufactured gas, Low btu gas, High btu gas, Methane, Anaerobic processes, Cost analysis, Cost estimates, Inventories.

Identifiers: Manure, Energy resources, Feedstocks.

Since agricultural residues (crop and forest wastes and animal manures) constitute a potential supplemental source of energy, the authors examine the availability of such residues and evaluate their potential use as an energy feedstock. The report is presented in two volumes: the method of approach used in inventory development, the collection, harvesting, and conversion economics, and the overall concept assessment are presented in Volume I.

PB-261 033/5 PC A12/MF A01

Michigan Univ., Ann Arbor. Dept. of Natural Resources.

The Social and Economic Importance of the Caroni Swamp In Trinidad and Tobago

Doctoral thesis

Bal Siew Ramdial. 1975, 270p NOAA-76092907

Descriptors: *Recreation, *Economic development, *Caroni Swamp, Land use, Assessments, Fishing, Shellfish, Natural resources, Recreational facilities, Social effect, Values, National parks, Theses, Trinidad and Tobago.

Identifiers: Sea Grant program, *Tourism.

The purpose of this study was to assess the social and economic values of the Caroni Swamp as of 1974 and to generate more attention and wider public interest in one of Trinidad and Tobago's most beautiful landscapes. The study finds that various unmet need states such as temporary escape, experiencing nature, intellectual stimulation, affiliation, achievement and physical exercise are gratified by a visit to the Swamp. Over 90% of the visitors thought it worthy of preservation. The study estimates the recreational resources of the Swamp at \$1,038,500 and the number of persons earning a living at 240 full-time and 105 part-time. It estimates the fin and shell fish harvest and value at 1,589,170 lbs. and \$981,450 and based on a total annual return of \$2,020,020, calculates the present worth of the Swamp at \$4,000 per acre. The study concludes that the Swamp, though neglected, has many social and economic values beyond tourism.

PB-261 117/6 PC A05/MF A01

National Highway Traffic Safety Administration, Washington, D.C. Technical Services Div.

Bicycle Safety

Subject bibliography

Lois Flynn. Mar 76, 79p* Rept nos. DOT-HS-801 931, SB-02

See also PB-261 118.

Descriptors: *Bicycles, *Traffic safety, *Bibliographies, Motor vehicle accidents, Accident prevention, Safety engineering, Urban transportation, Research.

Identifiers: *Bikeways.

The bibliography represents literature acquired since the establishment of the National Highway Traffic Safety Administration (NHTSA) in 1967, as related to bicycle safety. It is comprised of NHTSA contract reports, reports of other organizations concerned with highway safety, and articles from periodicals in related fields. Citations follow the format used in the monthly abstract journal Highway Safety Literature and are indexed by a keyword-out-of-context (KWOC) listing, author, corporate author, contract number, and report number.

PB-261 254/7 PC A11/MF A01

Montana State Univ., Bozeman. Water Resources Research Center.

Shallow Ground-Water Salinization in Dryland Farm Areas of Montana

Graham R. Thompson, and Stephan G. Custer. Sep 76, 228p MUJWRRC-79, OWRT-A-094-MONT(1)
Contract DI-14-34-0001-6027

Descriptors: *Water pollution, *Ground water, *Salinity, *Arid land, *Farms, Irrigated land, Percolation, Sodium, Magnesium, Calcium, Sulfates, Shale, Weathering, Ammonium compounds, Water analysis, Bacteria, Seepage, Cultivation, Montana.

Saline seeps have developed on 106,000 ha in Montana between 1954 and 1975 due to excess percolation of water below the rootzone in response to irrigation and summer fallow. The ground water below paired cultivated and uncultivated dryland-farm sites on Colorado Group shale near Rapelje, Stillwater County, Montana, contains about 9000 ppm total dissolved solids at both sites and is dominated by sodium, magnesium, calcium and sulfate. Bedrock environment of deposition, weathered and unweathered mineralogy, exchangeable cations, and ground-water chemistry indicate that the salinity source is rock weathering. Moisture management with new cropping techniques remain the key to amelioration of the saline seep problem.

PB-261 268/7 PC A02/MF A01

Skokomish Tribal Council, Shelton, Wash.
Fish Processing Plant Management Assistance for Skokomish Tribal Council, Mason County, Washington

Nov 76, 12p EDA-76-073
Grant EDA-07-6-01480

Descriptors: *Food processing, *Fishes, *Economic development, American Indians, Industrial plants, Marketing, Inventories, Accounting, Employment, Production planning, Revenue, Sales, Indirect costs, Training, Personnel, Salmon, Environmental impacts, Industrial waste treatment, Tables(Data), Washington(State).
Identifiers: *Mason County(Washington).

This study seeks to provide assistance and training of tribal members in the management, processing, and marketing of salmon and seafood in the new tribally owned processing plant. Along with the training of personnel to operate the plant, the plant seeks to establish accounting, inventory and production systems. The benefits of the plant would be three fold. First, the plant would insure that fishermen would receive a fair price for their catch. Second, employment for tribal members on the reservation would be created and third, the seafood processing plant would have the potential of earning sufficient revenues to be used for the development of additional business and jobs.

PB-261 818/9 PC A06/MF A01

Asian Inst. of Tech., Bangkok (Thailand).
Ferrocement, A Versatile Construction Material: Its Increasing Use in Asia

Ricardo P. Pama, Seng-Lip Lee, and Noel D. Vietmeyer. 1976, 114p*

Proceedings of Workshop on Introduction of Technologies in Asia-Ferrocement, a case study. Held at Bangkok (Thailand) on November 5-8, 1974. Sponsored in Part by Agency for International Development, Washington, D.C. Office of Science and Technology, and National Academy of Sciences, Washington, D.C.

Descriptors: *Reinforced concrete, *Meetings, Thailand, Construction materials, Concrete construction, Shipbuilding, Technology transfer, Residential buildings, Bins, Water tanks.
Identifiers: *Ferrocement.

The workshop brought together engineers, scientists, administrators, and businessmen and gave them the opportunity to exchange views on, and experience with, ferrocement. The workshop's basic purposes were: (1) to survey both the state of the art of ferrocement technology and its applications important to Southeast Asia; (2) to provide information on ferrocement research and development taking place in Asia and to share the knowledge and experience gained thus far; (3) to discuss the most promising methods of introducing

ferrocement technology to Asia from the point of view of effectiveness, cost, and social acceptability; (4) to recommend areas of technical and social research that need to be carried further with respect to ferrocement. Demonstrations of ferrocement construction were held during the workshop. Fifty five participants from 17 nations attended. Immediately following the workshop, a demonstration for the benefit of some 50 village heads from several districts in Pathumtani province was held.

PB-262 039/1

PC A04/MF A01

Woods Hole Oceanographic Institution, Mass.
Marine Technology Transfer as Foreign Aid to Less Developed Nations from Oceanographic Institutions in Industrialized Countries: A Search for an Effective Mechanism in the Educational Sector

Technical rept.

M. Lamin Sarr. Sep 76, 59p WHOI-76-84, NOAA-76111031

Grant NOAA-04-6-158-44016

Descriptors: *Marine engineering, *Technology transfer, *Developing countries, Systems analysis, Organizations, Performance evaluation, Oceanography, Training devices, Organizations, Problem solving, Personnel development, Scientists, Foreign aid.
Identifiers: Deficiencies, Industrialized countries.

This study examines systems of transferring marine technology through education and training and suggests solutions to the problems that have been the cause of failure in the process. In so doing, the nature of the educational institutions, both in the industrialized nations and in those developing nations where they exist have been reviewed. Inadequacies have been identified at both levels; inadequacies that stem not only from the educational systems but also concerning government involvement as well as social attitudes. This problem identification is followed by suggested solutions for each case and in some instances such suggestions are supported and substantiated with descriptions of cases where success or at least potential for success have been achieved.

PB-262 155/5

PC A08/MF A01

Illinois Univ. at Chicago Circle. Dept. of Materials Engineering.

Ferrocement in Bending, Part I: Static Nonlinear Analysis

Progress rept.

P. Balaguru, A. E. Naaman, and S. P. Shah. Aug 76, 154p Rept no. 76-2

Grant NSF-ENG74-20829

Descriptors: *Beams(Supports), *Reinforced concrete, Loads(Forces), Bending, Reinforcing materials, Stress strain diagrams, Crack propagation, Computer programs, FORTRAN.

Identifiers: Ferrocement, FORTRAN 4 programming language.

An analytical and experimental investigation of ferrocement beams subjected to flexure with monotonically increasing load are presented. Experiments were carried out to determine the stress-strain curves of the constituent materials: mortar and different steel meshes; and to find the load-deflection curves, crack distribution and crack width for ferrocement beams reinforced with varying volumes of welded and woven steel meshes. An analytical model was formulated to analyze and predict the nonlinear load-deflection behavior of ferrocement beams from the measured stress-strain curves of the constituent materials. The experimental results of this investigation and some published data on reinforced concrete were used to verify the validity of the model. The model satisfactorily predicts the load-deflection curves of ferrocement and reinforced concrete beams. Based on the model a simple relationship is proposed to predict the crack width versus steel stress for ferrocement beams.

PB-262 171-T

PC A03/MF A01

Environmental Protection Agency, Research Triangle Park, N.C. Translation Services Section.

SELECTED APPROPRIATE TECHNOLOGIES

The Rickets-Producing Effect of Beryllium Carbonate (L'azione Rachitogena del Carbonato di Berillio)

Lino Businco. Dec 74, 39p Rept no. EPA-TR-75-163
Trans. of Rassegna di Medicina Industriale (Italy v11 p417-442 1940.

Descriptors: *Beryllium organic compounds, *Rickets, *Musculoskeletal disorders, *Toxicity, Rats, Experimental data, Laboratory animals, Berilliosis, Occupational diseases, Toxicology, Pathology, Italy, Translations.

Experiments carried out with young rats have indicated that beryllium carbonate can adversely affect the osteogenic processes leading to a series of pathological manifestations including weight loss, curving of the spine, hyperplastic alterations of the conjugation cartilage, modifications of the underlying trabecular structure, hypocalcification, and thickening of the chondrocostal joints. This rickets cannot be attributed to a simple deficiency, since it can be brought about also through maternal milk, and since it cannot be modified by cod liver oil or by vitamin-containing preparations; a broader pathogenic process must be involved, in which toxicity may have the main role.

PB-262 179/5 PC A08/MF A01
Connecticut Valley Historical Museum, Springfield, Mass.

The Upper Factory Brook Sawmill Site: An Early Industrial Site in Middlefield, Massachusetts

Final rept. May 74-Apr 76
John S. Wilson. Apr 76, 174p
Contract NPS-CX-4000-4-0026

Descriptors: *Sawmills, *Technology, *History, Methodology, Rural areas, Sites, Massachusetts, Equipment.

Identifiers: Shortcomings, Artifacts, *Middlefield(Massachusetts).

The rural millwright of colonial or early 19th-century America derived much of his technical information from sources very unlike the engineering texts of today. At best, he followed manuals which relied heavily upon 'rule-of-thumb' procedures. At worst, he used only his own experience as a guide. The results of such irregular information flow in a fairly technical craft have seldom been considered. The Upper Factory Brook Sawmill Site, an early 19th-century mill, was constructed by men relying on 'folk' knowledge, and exhibits several major flaws in its construction. These flaws demonstrate the problems resulting from an incomplete 'mental template' of a complex mechanism due to the incorrect or incomplete 'folk' knowledge of the builders, and indicate one of the effects of poor communication during a period of general technological advancement.

PB-262 338/7 PC A05/MF A01
National Center for Appropriate Technology, Butte, Mont.
A National Program to Develop and Implement Technologies Appropriate for Low-Income Communities
7 Sep 76, 93p OEO-LN-1710

Descriptors: *Community development, *Technology innovation, Low income groups, Energy, Conservation, Socioeconomic status, Information centers, Weatherproofing, Hydroponics, Solar heating, Wastes, Project planning.

The proposal for a National Center for Appropriate Technology suggests a program of research and development, with a specific mission in its first year of developing, modifying, adapting, and implementing technologies which can be helpful to poor people. Particularly it deals with the problems of rapidly increasing energy cost, and with a specific focus on technological support to the CSA Weatherization Program.

PB-262 489/8 PC A09/MF A01
Katzen (Raphael) Associates, Cincinnati, Ohio.

Chemicals from Wood Waste

Final rept.

Allan E. Hokanson, Vincent B. Diebold, Douglas W. Bennett, Russell P. Klier, and Stephen A. Stein. 24 Dec 75, 196p Rept no. AN-441
Sponsored in part by Forest Products Lab., Madison, Wis.

Descriptors: *Organic compounds, *Wood wastes, Economic analysis, Cost estimates, Carbinols, Methyl alcohol, Ethanol, Phenols, Furfurals, Formaldehyde, Operating costs, Capitalizing costs, Industrial plants, Process charting, Design criteria, Paper industry, Production.

A study of the economics of producing chemicals from wood waste was carried out for the Forest Products Laboratory. Results included: (1) outlining chemical processes based on known technology for producing methanol, ethanol, formaldehyde, furfural, and phenols from wood waste; (2) estimating investment and operating costs for these plants; and (3) comparing the economics with those for producing the same chemicals from more conventional raw materials.

PB-262 511/9 PC A05/MF A01
Action/Peace Corps, Washington, D.C. Information Collection and Exchange.

Visual Aids - A Guide for Peace Corps Volunteers

Program and training journal reprint series.

Mar 76, 82p Rept no. Reprint Ser-2

Descriptors: *Visual aids, *Public health, *Developing countries, *Handbooks, Instructional materials, Social welfare, Personnel development, Technology, Instructional materials, Selection, Methodology, Reference groups, Preparation, Fabrication, Motivation, International relations, Symbols.

Identifiers: Latrines, Peace Corps, Volunteers.

This volume, part of the Program and Training Journal Reprint Series, is integral to Peace Corps efforts to provide technical support to its Volunteers and to share its material on intermediate technology with other participants in the international development community. Successful intermediate technologies designed for use in developing countries utilize low cost, locally available resources and provide new methods and approaches that are relevant to the needs of the users. While supplementing, testing, and modifying the materials made and used volunteers will continue to develop new techniques and strategies. The questions, developments and adaptations will provide a framework for future manuals.

PB-262 604/2 PC A06/MF A01
DeLeuw, Cather and Co., San Francisco, Calif.

Safety and Locational Criteria for Bicycle Facilities User Manual. Volume II: Design and Safety Criteria

Final rept.

D. T. Smith, Jr. Feb 76, 104p* FHWA/RD-75-114
Contract DOT-FH-11-8132

See also Volume 1, PB-259 531.

Descriptors: *Bicycles, *Roads, *Safety, Manuals, Planning, Traffic safety, Right of way acquisition, Routes, Design criteria, Traffic engineering.

Identifiers: *Bikeways, Bikeway planning.

The manual is designed to assist a designer of bicycle facilities in providing a safe and effective environment for bicyclists, pedestrians and motor vehicle operators. The document discusses the bikeway design process and relates it to locational decisions. Route and right-of-way specifications are detailed. Various intersection treatments are presented. Signing and markings applicable to bikeways are also covered. Throughout the report, the emphasis is on the presentation of available information so as to allow the bikeway designer to choose the best alternative for his situation.

PB-262 606/7 PC A04/MF A01
ACTION/Peace Corps, Washington, D.C. Information Collection and Exchange.

Health Education: A Study Unit on Fecal-Borne Diseases and Parasites

Program and training journal reprint series

Merry Lee Corwin. Mar 76, 60p Rept no. Reprint Ser-1
Prepared by Peace Corps/Philippines.

Descriptors: *Health education, *Parasitic diseases, Manuals, Public health, Feces, Infectious diseases, Parasites, Life cycles, Disease vectors, Preventive medicine, Philippines, Developing countries.

The purpose of this unit is to help the student reach a real understanding of how a person's habits determine his health. Through a step-by-step learning procedure, this unit is designed to present the knowledge necessary to gain this understanding in a logical progression. The child should be educated about these diseases so that in the end he will understand (1) that these diseases are important to know about; (2) that a certain few things are spreading them; (3) that these diseases can be prevented; (4) that each person is responsible for the state of his own health. All these diseases are prevalent in the Philippines, and they are here mainly because most people simply do not know about them and how they are spread and how serious they are. It has been found that if this unit is well taught in the school, it can generate effects which will result in the improvement of health and sanitation practices in the community.

PB-262 630/7 PC A03/MF A01
ACTION/Peace Corps, Washington, D.C. Information Collection and Exchange.

Peace Corps Intermediate Technology for 15 Years

Program and training journal reprint series.
May 76, 32p Rept no. Reprint Ser-A

Descriptors: *Mechanical engineering, *Developing countries, *Technology innovation, Manuals, Experimental design, Performance evaluation, Equipment, Creativity, Centrifuges, Dusting, Belows, Pest control, Braille, Blocks, Grain, Storage, Drying apparatus, Silos, Construction, Earthquake resistant structures, Tiles, Roofs.

Identifiers: *Contrived equipment, Peace Corps, Volunteers, Letter blocks, Crop dusters, Grain storage.

The effort to devise and implement intermediate technologies has been a hallmark of Peace Corps activity since the organization's inception in 1961. A major effort is currently underway to take Volunteer-developed technologies beyond the areas where they were first devised and to make them available to the wide range of development workers who may need them. Manuals are issued that review Peace Corps-generated materials.

PB-262 735/4 PC A07/MF A01
Texas Univ. at Austin. Center for the Study of Human Resources.

An Analysis of Selected Start-Up Industry Training Programs as Vehicles for Human Resources Development

Final rept. Aug 73-1976

Roy R. Van Cleve. Dec 76, 135p DLMA-21-48-

74-01-1

Grant DL-21-48-74-01

Extracts Presented - Task Force on Southern Rural Development, August, 1975. ASSA December 1975, Dallas.

Descriptors: *Industrial training, *Technology innovation, *Economic development, *Low income groups, Manpower utilization, Upgrading, Salaries, Personnel development, Hypotheses, Regression analysis, Projects, Evaluation, Unemployment, South Carolina, North Carolina, Virginia, Alabama, Counties, Socioeconomic status, Regional planning, Specialized training, Economic surveys.

Identifiers: Underemployment.

The 'start-up' industry training concept has received considerable attention as a way to better match workers and jobs, to 'leapfrog' the industrial development process by attracting higher-wage industry to an area through upgrading local work forces, and to make it possible to increase the wages of low-income workers. This study examines in detail the programs of South Carolina, North Carolina, Virginia and Alabama and their

SELECTED APPROPRIATE TECHNOLOGIES

effect on industrial relocation trends and the leapfrogging of the unemployed and underemployed into the labor force.

PB-262 745/3 PC A06/MF A01
ACTION/Peace Corps, Washington, D.C. Information Collection and Exchange.

A Glossary of Agricultural Terms: English-Spanish, Spanish-English
Program and training journal reprint series.
Mar 76, 103p Rept no. Reprint Ser-9
Prepared by American Univ., Washington, D.C. American Language Center. Sponsored in part by International Cooperation Administration, Washington, D.C.

Descriptors: *Agriculture, Dictionaries, Spanish language, English language, Instructional materials.

This bilingual glossary is a modest attempt to fill one of the needs of Spanish-speaking agriculturists receiving training under the program of the International Cooperation Administration. The list is not complete in any sense. It is based largely on suggestions made by experts engaged in the training of foreign agricultural specialists both abroad and in the United States.

PB-262 754/5 PC A14/MF A01
ACTION/Peace Corps, Washington, D.C. Information Collection and Exchange.

Health Training Resource Material for Peace Corps Volunteers
Program and training journal reprint series.
1976, 318p Rept no. Reprint Ser-3

Descriptors: *Specialized training, *Hygiene, *Developing countries, *Health education, Nutrition, Sanitation, Children, Food, Clothing, Washing, Insect control, Public health, Instructional materials.

Identifiers: Peace Corps volunteers.

This volume, part of the Program and Training Journal Reprint Series, is integral to Peace Corps efforts to provide technical support to its Volunteers and to share its material on 'intermediate technology' with other participants in the international development community. Successful intermediate technologies designed for use in developing countries utilize low cost, locally available resources and provide new methods and approaches that are relevant to the needs of the users. Each Reprint, concentrating on a specific topic, is intended to contribute to PCVs' ability to respond creatively to challenges in the field.

PB-262 768/5 PC A04/MF A01
ACTION/Peace Corps, Washington, D.C. Information Collection and Exchange.

An Expanded Collection of Language Informant Techniques
Program and training journal reprint series
Gary Engelberg, Jun 76, 58p Rept no. Reprint Ser-12
Prepared by ACTION/Peace Corps, Dakar (Senegal). Regional Training Resource Office.

Descriptors: *Languages, *Learning, Methodology, Specialized training, Developing countries.
Identifiers: Peace Corps volunteers.

Techniques for learning the sounds and structures of a language, especially unwritten, from native speakers of the language, usually pedagogically unskilled and often unlettered, have long been part of modern descriptive linguistics. But the Peace Corps has only recently recognized their value. Their purpose is to allow PCVs to: (1) Continue language learning in the field without trained teachers; (2) avoid the pitfall of talking about language through involved grammatical discourse with local 'scholars'; (3) develop their own materials concentrating on problems peculiar to their dialect area and job when texts, especially drills and exercises, are unavailable; and (4) create varied and interesting learning sessions for both Volunteer and informant.

PB-262 851/9 PC A05/MF A01
ACTION/Peace Corps, Washington, D.C. Information Collection and Exchange.
L'Utilisation du Silo Fosse et des Lecons Techniques. (The Use of Pit Silos, and Technical Lessons.)

Program and training journal reprint series
Leslie A. Temanson. Jun 76, 76p Rept no. Reprint Ser-15
Text in French. Adapted from a brochure, 'Les Silos Fosses dans le Savane Africaine' by James E. Diamond, 1971.

Descriptors: *Silos, *Underground storage, Developing countries, Africa, Agriculture, Instructional materials.

The report describes the construction, use, and maintenance of underground silos for agricultural purposes. Also included is an instruction manual related thereto. (Portions of this document are not fully legible.)

PB-262 929/3 PC A16/MF A01

ACTION/Peace Corps, Washington, D.C. Information Collection and Exchange.

Combatting Hansen's Disease
Program and training journal reprint series
Daniel T. Pekarske. Jun 76, 371p Rept no. Reprint Ser-16

Descriptors: *Leprosy, Developing countries, Malaria, Bacterial diseases, Infectious diseases, Mycobacterium leprae, Physiology, Pathophysiology, Immunology, Epidemiology, Pathology, Clinical medicine, Public health, Health education, Diagnosics, Chemotherapy, Social welfare, Patients, South Korea, Health science centers, Government, Preventive medicine.

Identifiers: *Hansen's disease, Chronic disease management.

Contents:

- Pertinent physiology and immunology;
- Hansen's Disease--three perspectives;
- Health education;
- Case finding;
- Diagnosis;
- Patient management;
- Cooperating institutions.

PB-263 089/5 PC A09/MF A01
Hawaii Univ., Honolulu. Water Resources Research Center.

Eutrophication and Fish Toxicity Potentials In a Multiple-Use Subtropical Reservoir
Technical rept.

Reginald H. F. Young, Gordonn L. Dugan, L. Stephen Lau, and Hiroshi Yamauchi. Jul 75, 191p TR-89, W77-03825

Descriptors: *Water pollution, *Reservoirs, *Sewage treatment, *Aquatic biology, Algae, Growth, Fishes, Toxicity, Phosphorus, Nitrogen, Bioassay, Concentration(Composition), Tables(Data), Sediments, Chlorine, Tolerances(Physiology), Nutrients, Oxygen, Dissolved gases, Oahu Island, Hawaii.
Identifiers: *Eutrophication, *Wahiaawa Reservoir, *Water quality data.

The impact of secondary-treated effluents from the Wahiaawa and Whitmore Sewage Treatment Plants on the Wahiaawa Reservoir, Oahu, was investigated in terms of water and sediment quality, algal growth potential, and fish toxicity. Reservoir and waste water management alternatives were investigated based on these environmental inputs and preliminary estimates of costs and benefits of the alternatives. Nitrogen and phosphorus resulting from the discharges were determined to be responsible for seasonal stresses on both the water quality and fishes. The two most feasible alternatives for improving the situation were reuse of secondary effluent for sugarcane irrigation and seasonal tertiary waste water treatment with the latter being the more favored of the two.

PB-263 155/4 PC A22/MF A01

Office of Water Research and Technology, Washington, D.C. Water Resources Scientific Information Center.

Irrigation Efficiency. A Bibliography. Volume 2
Rept. for Mar 73-Sep 76.
Dec 76, 512p* Rept nos. OWRT/WRSIC-76/206, W77-03968
See also PB-220 349.

Descriptors: *Irrigation, *Bibliographies, Efficiency, Farm crops, Water supply, Sprinkler irrigation, Subsurface irrigation, Surface irrigation, Patents, Water conservation, Soil moisture, Deserts, Arid land, Salinity, Agronomy, Ground water, Pumping. Identifiers: *Drip irrigation, Trickle irrigation.

This report, containing 346 abstracts, is another in a series of planned bibliographies in water resources produced from the information base comprising SELECTED WATER RESOURCES ABSTRACTS (SWRA). Volume 2 covers the period from March 1973 through September 1976 (Volume 9, Number 18). Author and subject indexes are included.

PB-263 349/3 PC A07/MF A01
ACTION/Peace Corps, Washington, D.C. Information Collection and Exchange.

Teaching Manual: School Gardens and Nutrition. (Manual Didactico: Huertos Escolares y Nutricion)

Program and training journal reprint series.
Sep 76, 144p Rept no. Reprint Ser-18
Prepared by Peace Corps/Guatemala. Originally published by Ministerio de Educacion, Guatemala City. Programa de Nutricion y Huertos Escolares para el Area Rural. Text in Spanish.

Descriptors: *Health education, *Nutrition, *Horticulture, *Hygiene, Public health, Manuals, Developing countries, Vegetables, Guatemala, Rural areas, Instructional materials.

Identifiers: Peace Corps volunteers, *Gardens.

The report is a teachers manual covering school gardens, nutrition, and personal hygiene. It was originally intended for use by Peace Corps Volunteers working in rural primary schools in Guatemala.

PB-263 350/1 PC A05/MF A01
ACTION/Peace Corps, Washington, D.C. Office of Multilateral and Special Programs.

Resources for Development: Organizations and Publications
Program and training journal manual series.
Nov 76, 93p Rept no. Manual Ser-3A

Descriptors: *Organizations, *Social welfare, *Project planning, International relations, Economic development, Businesses, Education, Specialized training, Developing countries, Labor unions, Rural areas, Technical assistance, Instructional materials, Children, Energy, Farms, Housing, Resources, Marketing, Family relations, United States, Africa, Asia, Latin America, Periodicals.
Identifiers: Peace Corps, Cooperatives.

The report was compiled to enable Peace Corps field workers to coordinate their efforts with those of other development agencies and organizations. Planning and implementing programs in conjunction with others will maximize efficiency, enhance Peace Corps contributions, and increase opportunities for learning.

PB-263 399/8 PC A19/MF A01
Texas A and M Univ., College Station. Dept. of Marine Resources Information.

Proceedings of the Annual Tropical and Sub-tropical Fisheries Technological Conference (First) Held in Corpus Christi, Texas on March 8-10, 1976. Volume I

Bryant F. III Cobb, and Alexandra B. Stockton. Oct 76, 432p, TAMU-SG-77-104, NOAA-76122901

Grant NOAA-04-6-158-44012

Descriptors: *Fisheries, *Tropical regions, *Meetings, Shellfish, Crustacea, Aquaculture, Marine biology, Biochemistry, Contamination, Biphenyl, Fresh water fishes, Marine fishes, Seafood, Hydrocarbons, Animal diseases, Shrimps, Reproduction(Biology), Animal physiology, Market research, Lobsters.

SELECTED APPROPRIATE TECHNOLOGIES

Identifiers: Sea Grant program, Biphenyl/chloro.

Volume I of the Proceedings of the First Annual Tropical and Subtropical Fisheries Technological Conference contains the following papers: The value of technology to the seafood industry; The FAO programme of cooperative research in tropical fish technology; The spoilage of fish in the tropics; Cellular aspects of reproduction in Penaeid shrimp; Texas A&M University shrimp mariculture program; Current status of the culture of river shrimps of the Genus *macrobrachium*; Chemical and nutritive composition of shrimp; Biochemistry and physiology of shrimp - effect on use as food; Cholesterol in crustacea; Water migration and dehydration in stored frozen breaded shrimp; International standardization of shrimp products - U.S. contribution; Bacteriology of shrimp; Time and temperature parameters for the destruction of *Salmonella* in cooked, peeled and deveined shrimp; Trace elements found in various species of shrimp harvested from selected areas; Polychlorinated biphenyls in shrimp; Analysis of petroleum hydrocarbon contamination in shrimp; Sodium bisulfite and its residual use in controlling blackspot in shrimp; Utilization of recovered shrimp protein as a pigment source for salmonids; and the status of the shrimping industry.

PB-263 669/4 PC A02/MF A01
Indo-Pacific Fisheries Council, Bangkok (Thailand).

The Technology and Economics of Small-Scale Commercial Prawn (*Macrobrachium rosenbergii*) Hatcheries: A Case Study in Thailand
Occasional paper
Cort W. Kloke, and Manu Potaros. May 75, 22p
Rept no. IPFC-Occ.Pap.-1975/1
See also PB-263 670.

Descriptors: *Crustacea, *Rivers, *Economic analysis, *Fishes, *Thailand, Shellfish, Demand(Economics), Aquaculture, Equipment, Manpower, Pumps, Foreign countries, Management, Water supply, Reproduction(Biology), Maintenance, Larvae, Cost analysis, Tables(Data), Feeding stuffs, Marketing, Developing countries.
Identifiers: **Macrobrachium rosenbergii*.

Several small-scale private commercial and family operated prawn hatcheries have been established in Thailand to fill the demand for juveniles for culture, and the objective of this paper is to describe and comment on the practical operation and economic experience of two such commercial hatcheries so as to give those interested in the industry and potential prawn culturists some practical insights into the requirements, potentials and problems of hatchery operation. The paper takes the form of a case study with commentary and suggestions for improvement. It is divided into three sections: (1) actual technical description of each hatchery's operation, (2) economic analysis and (3) discussion and concluding observations.

PB-263 670/2 PC A02/MF A01
Indo-Pacific Fisheries Council, Bangkok (Thailand).

The Technology and Economics of Catfish (*Claris spp.*) Farming In Thailand
Occasional paper
Cort W. Kloke, and Manu Potaros. Jun 75, 23p
Rept no. IPFC-Occ.Pap.-1975/2
See also PB-263 669.

Descriptors: *Catfishes, *Aquaculture, *Thailand, Developing countries, Economic development, Food supply, Demand(Economics), Prices, Exports, Market research, Fresh water, Foreign countries.
Identifiers: **Clarias batrachus*, **Clarias macrocephalus*.

The catfish species *Clarias batrachus* and *Clarias macrocephalus* are very popular table fish in Thailand. The two species make up almost 30% of Thailand's fresh-water production with *C. batrachus* (*Pla duk dan*) accounting for about 90% of that amount. Demand for both of these fish is very strong and growing rapidly despite their high price. *C. macrocephalus* is the preferred species for its appearance and eating qualities and commands a higher price particularly in what appears to be a

lucrative export market. The report describes research on production, consumption, and economics.

PB-263 671/0 PC A07/MF A01
Indo-Pacific Fisheries Council, Bangkok (Thailand).

Preliminary Bibliography of Fish and Fisheries with Special Reference to Shrimps and Prawns
Occasional paper
Agnes Jiannee. Jul 75, 138p Rept no. IPFC-Occ.Pap.-1975/3
See also PB-263 670 and PB-263 672.

Descriptors: *Shrimps, *Crustacea, *Bibliographies, *Thailand, Economic development, Aquaculture, Deep water, Ecology, Marine biology, Population(Statistics), Fishing, Foreign countries, Life cycles, Dehydration, Fresh water fish, Shellfish, Fisheries, Developing countries.

The bibliography includes research on aquaculture, fisheries, life cycles, ecology, fish diseases, equipment, fishing, and general studies.

PB-263 672/8 PC A02/MF A01
Indo-Pacific Fisheries Council, Bangkok (Thailand).

Aquaculture as an Integral Part of the Agricultural Farming System. A Case Study in the North-East of Thailand

Occasional paper
Cort W. Kloke, and Manu Potaros. Jul 75, 15p
Rept no. IPFC-Occ.Pap.-1975/4
See also PB-263 671.

Descriptors: *Aquaculture, *Agriculture, *Thailand, Developing countries, Maps, Municipalities, Farms, Boundaries, Economic development, Market research, Food supply, Foreign countries, Lagoons(Ponds), Farm crops, Statistical data, Fishes, Production, Social effect, Irrigation, Cost analysis, Income.

There is an increasing recognition and acceptance of the concept that development activities and efforts in the less developed countries of the world must be directed to the improvement of the income, security and standard of living of small low-income farmers, who constitute the vast bulk of the population of these countries. The practice of simple types of small-scale aquaculture offers excellent possibilities, particularly in Asia and the Far East, for helping to achieve the goals of diversification, increased cash incomes, improved quantity and quality of food produced for home consumption, and exploitation of un-utilized resources currently available to small farmers. Aquaculture is not new to the region, but it is not always recognized that its practice can be, and often is an integrated and natural part of the agricultural system with wide-spread involvement of small farmers. Just as most small farmers keep a few ducks and chickens to supplement their tables and their incomes, many more of them could operate a small managed fish pond.

PB-263 840/1 PC A03/MF A01
ACTION/Peace Corps, Washington, D.C. Information Collection and Exchange.

Improved Practices In Corn Production. A Guide for Peace Corps Volunteers

Program and training journal reprint series
Dave Leonard. Mar 76, 50p Rept no. Reprint Ser-7

Prepared by Peace Corps Training Center, Arecibo, Puerto Rico.

Descriptors: *Corn plants, *Agronomy, Production, Manuals, Yield, Seeds, Planting, Fertilizers, Insect control, Weed control, Storage, Shrinkage, Fungicides, Spacing, Tropical regions, Developing countries, Instructional materials.

Contents:

- Some handy conversions;
- The 'package' approach to improving crop yields;
- Some important facts on corn;
- Use high yielding varieties;
- Select seed carefully for planting;
- Treat seeds with a fungicide;

Improved plant populations and spacing;
Use fertilizer;
Control insects;
Control weeds;
Reduce storage losses.

PB-264 137/1 PC A03/MF A01
National Bureau of Standards, Washington, D.C. Inst. for Applied Technology.

Preservation of Historic Adobe Structures - A Status Report

Final rept.
James R. Clifton. Feb 77, 37p Rept no. NBS-TN-934
Sponsored in part by National Park Service, Washington, D.C.

Descriptors: *Buildings, *Construction materials, *Cohesive soils, Mechanical properties, Soil properties, Moisture content, Clay soils, Physicochemical properties, Preserving.

Identifiers: *Adobe soils, Historic buildings, *Historic preservation.

The physicochemical and mechanical properties of adobe soils and building materials, and the technology of preserving historic adobe structures have been critically reviewed. In most cases, the deterioration of adobe structures can be directly or indirectly correlated with the presence of excess moisture. Therefore, the successful preservation of most historic adobe structures depends largely on effectively protecting these structures from water. This review indicates that the technology of preserving adobe structures needs further development to ensure the longevity of the structures. Areas in which research is needed have been identified and include: (1) the development of standard methods to characterize the composition and physical properties of adobe soils, and the mechanical properties of adobe brick; (2) nondestructive methods to measure the water contents of and water movement in adobe structures; and (3) the evaluation of the effectiveness of different types of preservation materials and methods.

PB-264 170/2 PC A05/MF A01
National Research Council, Washington, D.C. Board on Science and Technology for International Development.

Guayule: An Alternative Source of Natural Rubber
Final rept.
Mar 77, 91p* Rept no. CIR/BOSTID-77/22
Contract BIA-K51C14200978, AID/csd-2584

Descriptors: *Shrubs, *Natural rubber, *Deserts, Plants(Botany), Sources, Economic development, Production, Arid land, Farm crops, Employment, American Indians, Developing countries, Texas, New Mexico, Arizona, California, Agriculture, Financing, Quality, Extraction, North America.
Identifiers: *Guayule, **Parthenium argentatum*, *Hevea brasiliensis*.

The report describes a little-known bush that grows wild in deserts of North America and produces a rubber virtually identical with that from the rubber tree. It recommends funding for guayule development.

PB-264 302/1 PC A03/MF A01
Environmental Science and Engineering, Inc., Gainesville, Fla.

Background Document: Bagasse Combustion In Sugar Mills

Robert Baker, and Thomas F. Lahre. Jan 77, 45p
EPA/450/3-77/007
Contract EPA-68-02-1402
See also PB-223 996.

Descriptors: *Bagasse, *Air pollution, Industrial plants, Scrubbers, Sugarcane, Physical properties, Process charting, Combustion products, Furnaces, Design criteria, Particle size distributions, Fuels, Cyclone separators, Concentration(Composition), Flue gases, Air pollution control equipment, Industrial wastes, Nitrogen oxides, Boilers, Sulfur dioxide.

Identifiers: Refuse derived fuels, Wet methods, *Emission factors.

SELECTED APPROPRIATE TECHNOLOGIES

This is a background document in support of the contents of Section 1.8 of AP-2, Compilation of Air Pollutant Emission Factors, Second Edition. It concerns the major criteria pollutants emitted during the combustion of bagasse (a fibrous waste product in a sugar cane mill) in steam boilers. The general aspects of mill operations, physical characteristics of the bagasse and its combustion, furnace designs, air pollution control devices and factors affecting emissions are described. Stack emission tests are reviewed and analyzed for inclusion in the data base for developing factors for particulate and NO_x emission while firing bagasse or bagasse and fuel oil. The reliability of these factors is evaluated and presented.

PB-264 457/3 PC A06/MF A01
National Research Council, Washington, D.C.
Committee on Renewable Resources for Industrial Materials.

Biological Productivity of Renewable Resources Used as Industrial Materials
James S. Bethel. 1976, 112p* NSF/PRA-7501069/3/7
Contract NSF-STP75-01069
See also report dated Sep 76, PB-257 357.

Descriptors: *Natural resources, *Forestry, *Agriculture, *Energy conservation, Cellulose resins, Forecasting, Economics, Performance evaluation, Ethylene, Vegetable oils, Flax plants, Cotton plants, Industrial plants, Biomass, Polymers, Environmental impacts, Utilization, Wood products, Structural timber, Byproducts, Leather, Farm crops, Industrial plants, Soybean plants, Production management, Assessments.
Identifiers: *Renewable resources, Fuel substitution.

The report estimates the biological productivity of industrial renewable resources in terms of current yields, existing land bases, and increments to these bases that may reasonably be forecast by 1985 and 2000. The forecast divides naturally into two parts: the silvicultural product of wood, and products for industry from agriculture consisting chiefly of vegetable fibers, oil seeds, wool, animal fats, tallow, and hides. Wood is not only by far the most important renewable resource used for industrial materials, but also one whose production can be greatly increased if needed. Agricultural products include cotton and other vegetable fibers. Furthermore, there is little reason to believe that market demand will strain biological potential by 1985 or 2000. Under these conditions, long-term estimates of productivity become a mere exercise in imagination. Consideration is made of the energy requirements and environmental impacts associated with the implementation of the recommendations on these renewable resources.

PB-264 459/9 PC A04/MF A01
National Research Council, Washington, D.C.
Committee on Renewable Resources for Industrial Materials.

Extractives as a Renewable Resource for Industrial Materials
James S. Bethel. 1976, 74p* NSF/PRA-7501069/5/7
Contract NSF-STP75-01069
See also report dated Sep 76, PB-257 357.

Descriptors: *Organic compounds, *Energy conservation, *Extractives, *Natural resources, By-products, Wood products, Leather, Forestry, Agriculture, Bark, Economics, Cost estimates, Residues, Vegetable oils, Tallow, Fats, Oils, Marine biology, Fuels, Industrial wastes, Utilization, Forecasting, Water pollution control, Waste treatment, Materials recovery, Aquatic plants, Polymers, Plastics, Petrochemistry.
Identifiers: Renewable sources, Naval stores, Fuel substitution.

Extractives from plants and animals are used to varying degrees in manufacturing processes of industrial goods. Bark, oleoresin, waxes, oils and fats, and tallow are covered in this report. These products are derived from forest, agricultural and marine sources. Consideration of the energy requirements and environmental impacts associated with the implementation of the recommendations are included in this report.

PB-264 561/2 PC A12/MF A01
National Research Council, Washington, D.C.
Committee on Renewable Resources for Industrial Materials.

Fibers as Renewable Resources for Industrial Materials
James S. Bethel. 1976, 271p* NSF/PRA-7501069/7-7
Contract NSF-STP75-01069
See also PB-257 357.

Descriptors: *Natural fibers, *Energy conservation, *Environmental impacts, Assessments, Cost estimates, Economics, Paper industry, Textile industry, Plants(Botany), Fiber crops, Cotton plants, Wool, Hair, Cellulosic resins, Synthetic fibers, Leather, Feathers, Performance evaluation, Forecasting, Supply management, Paperboards, Forestry, Law enforcement, Water pollution, Air pollution, Utilization, Byproducts.
Identifiers: Renewable resources.

Contents:

The pulp, paper and paperboard industry introduction--(Assessment of the industry, some factors affecting the industry, enhancement of availability and utility of materials with reduction in costs, enhanced role of renewable fiber resources - an overview of product substitution, identification of educational roles and needs, and recommended research, its costs and returns, and time schedules);
Plant fibers other than wood and cotton; The textile industry--(Cotton, wool and mohair, the cellulosics and synthetic fibers); Feathers, furs and leather.

PB-264 594/3 PC A13/MF A01
Texas A and M Univ., College Station. Dept. of Marine Resources Information.

Proceedings of the Annual Tropical and Subtropical Fisheries Technological Conference (First) Held in Corpus Christi, Texas on March 8-10, 1976. Volume II
Bryant F. III Cobb, and Alexandra B. Stockton. Oct 76, 277p TAMU-SG-77-105, NOAA-77010401
Grant NOAA-04-6-158-44012
See also Volume 1, PB-263 399.

Descriptors: *Fisheries, *Fishes, *Shellfish, *Meetings, Tropical regions, Lipids, Metabolism, Catfishes, Feeding stuffs, Meat, Food processing, Mexico Gulf, Cod, Fresh water fishes, Crabs, Economic development, Market research, Lobsters, Aquaculture.
Identifiers: Sea Grant program, Subtropical regions.

This collection of 18 papers constitutes the second volume of the Proceedings of the Tropical and Subtropical Fisheries Technological Conference held March 8-10, 1976 at Corpus Christi, Texas. Titles included are: Transfer of Lipids through marine food chains; Lipid metabolism in Channel Catfish; Flavor problems in fish culture; Organoleptic and biochemical comparisons of cage raised and wild Striped Mullet; Utilization of insects as complementary diet in Channel Catfish feeding; Utilization of small mullet by a cold smoking process; Potential Demersal Fish fisheries in the Northwest Gulf of Mexico; Notes on the under-utilized fishery resources of the Gulf of Mexico; Salt minced cod; Yield and quality of mechanically separated flesh from several species of cultured freshwater fish; The effect of washing on color and texture of minced croaker; Functional properties influencing texture; Selected textural properties of cooked minced Atlantic Cutlass fish sticks; Roller extraction of crab meat; The economics of the commercial development of Gulf of Mexico bottomfish; Market potential for fish as an extender in meat products; An economic analysis of effort and yield in the Florida Spiny Lobster industry; and Publicly supported seafood product development research.

PB-264 638/8 PC A06/MF A01
Development Planning and Research Associates, Inc., Manhattan, Kans.

Feasibility of a Beef Processing Plant on the Blackfeet Indian Reservation
Nov 76, 103p P-192, EDA-77-054
Grant EDA-05-06-01520

Descriptors: *Economic development, *American Indians, Regional planning, Rural areas, Industrial plants, Meat, Processing, Economic analysis.
Identifiers: Technical assistance project, Blackfeet Indians, Indian reservations, Meat packing plants.

The study gives an analysis of a proposed beef packing plant with respect to markets and raw material supplies. The plant would be situated in an area of large surpluses of both livestock feed and calf supplies. It would be necessary to tie the packing plant to a feedlot. Ownership of both enterprises was to be integrated and the purpose of the feedyard was to even slaughter cattle supplies to the packing plant. Both locker-type plants and commercial plants are to be constructed. The Blackfeet Tribe in searching for development possibilities for their tribally controlled acres on the Reservation proposes to investigate the establishment of a beef packing plant.

PB-264 900/2 PC A06/MF A01
Ohio State Univ., Columbus. Dept. of Civil Engineering.

A Study of Runoff from Small Rural Watersheds In Response to Completed and Proposed Land Use Changes
Master's thesis
Michael Joseph Smith. 1972, 115p OWRT-B-005-OHIO(13)

Descriptors: *Hydrology, *Land use, *Runoff, *Watersheds, Strip mining, Agriculture, Water quality management, Industrial waste treatment, Theses, Upgrading, Sewage treatment, Tables(Data), Ohio.
Identifiers: *Agricultural watersheds, *Cumberland Plateau, *Allegheny Plateau.

The thesis pertains to the effect of land use and management upon the hydrology and water quality of two experimental watersheds; one, an agricultural area containing remnants of strip mining operations, and the other, a mixed cover agricultural watershed about to be subjected to a sharp upgrading of treatment. The analysis techniques used illustrate some procedures for determining changes in watershed hydrology. A longer period of study is recommended to make positive statements regarding changes in hydrologic response.

PB-265 105/7 PC A06/MF A01
Maryland Univ., College Park. Agricultural Experiment Station.

Solar Energy Applications In Agriculture: Potential, Research Needs, and Adoption Strategies
Filmore E. Bender, Andrew M. Cowan, Richard W. Dillon, James D. Hansford, Jr. and David A. Hurdis. Jan 76, 119 A-184, NSF/RA-760021
Contract USDA-12-14-1605-106, NSF-PTP75-10573
See also PB-255 928.

Descriptors: *Agriculture, *Solar heating, Solar drying, Solar space heating, Irrigation, Farm crops, Farm buildings, Greenhouses, Natural gas, Liquefied petroleum gas, Electricity, Fuel oils, Kerosene, Coal, Prices, Economic analysis, Recommendations.

Objectives pursued in this study are: (1) assessment of present agricultural operations to determine those with potential for use with solar energy; (2) development of recommendations for an overall experimental research program to establish the technical and economic feasibility of using solar energy in agricultural operations; and (3) formulation of recommendations for strategies to achieve adoption of solar energy components and systems in agriculture. Applications of solar energy to the following aspects of agriculture are examined: grain drying, tobacco curing, peanut drying, broiler housing, swine production, farm housing, greenhouses, and irrigation. Current fuel prices for each of the agricultural regions (determined by crop production) are also reviewed.

SELECTED APPROPRIATE TECHNOLOGIES

PB-265 159/4

PC A06/MF A01

Saint John's Univ., Jamaica, N.J.

A System for the Analysis, Evaluation and Design of Organizations, Work, and Jobs

Final rept.

Charles W. Lachenmeyer. 1977, 115p EDA/

OER-77/006

Grant EDA-PF-528, EDA-99-7-13336

Descriptors: *Job analysis, *Organization theory, Position(Title), Productivity, Personnel management, Management systems, Qualifications, Performance, Motivation, Technology innovation, Supervision, Manpower utilization, Job satisfaction, Design.

This report is in three parts. The Introduction catalogues the necessary components of a theory of the design of jobs and organizations. Part I of the report presents the job analytic system in detail. To maximize the transferability it is in the form of an ordered series of questions. When applied to a job situation, in total, the results will be the complete analysis of that situation, including the description of the jobs as they exist, the evaluation of the performance of workers in those jobs, the assessment of the adequacy of the jobs as structured, the assessment of the relations between those jobs and the adequacy of those relations within the organization, and finally, the generation of all the possible changes in the jobs with their anticipated outcomes, problems, etc. Part II of the report contrasts the advantages of this system with the disadvantages of previous efforts. With respect to the latter, two bodies of research and theory are reviewed exhaustively: job design, including job enrichment, job development, etc.; and job analysis. Part II can be read as a self-contained critical review of work in this area.

PB-265 161/0

PC A09/MF A01

National Research Council, Washington, D.C. Board on Science and Technology for International Development.

Making Aquatic Weeds Useful: Some Perspectives for Developing Countries

Survey rept.

1976, 184p*

Contract AID/csd-2584

Descriptors: *Aquatic weeds, *Weed control, *Developing countries, Wildlife, Utilization, Food supply, Management, Feeding stuffs, Sewage treatment, Livestock, Fishes, Cutting, Dewatering, Ruminants, Food consumption, Aquatic animals, Inland waterways, Fertilizers, Grasses, Tropical regions, Mammals.

Identifiers: *Trichechus, Herbivores.

This report examines methods for controlling aquatic weeds and using them to best advantage, especially those methods that show promise for less-developed countries. It emphasizes techniques for converting weeds for feed, food, fertilizer, and energy production. It examines, for example, biological control techniques in which herbivorous tropical animals (fish, waterfowl, rodents, and other mammals) convert the troublesome plants directly to meat. Though the techniques described in this report have been selected for their applicability in less-developed countries, many are relevant to industrialized countries. Both types of country face a future in which food production will need to depend more and more on the effective management of natural systems, such as waterways.

PB-265 237/8

PC A03/MF A01

Western Forest Products Lab., Vancouver (British Columbia).

Lathe Operators' Manual. Part II. Pressure Bars. Their Operation and Maintenance

Information rept.

W. V. Hancock, and O. Feihl. Oct 76, 39p* Rept no. VP-X-158

See also PB-240 534.

Descriptors: *Lathes, *Manuals, Woodworking machinery, Veneers, Peeling, Plywood, Rollers, Bars, Setting(Adjusting), Canada.

Identifiers: Pressure bars.

The development, design and operation of various types of pressure bars for veneer lathes is discussed in detail. The importance is stressed of a high level of maintenance and of accurate adjustment of the various lathe settings. The techniques for setting a veneer lathe are given together with a description of the special instrumentation that has been developed for this purpose.

PB-265 749/2

PC A06/MF A01

North Dakota State Univ., Fargo. Dept. of Agricultural Economics.

The Economic Feasibility of Establishing Oil Sunflower Processing Plants In North Dakota

Delmer L. Helgeson, David W. Cobia, Randal C. Coon, Wallace C. Hardie, and LeRoy W.

Schaffner. Apr 77, 110p Bull-503, EDA-77-080

Grant EDA-05-06-01485

Errata sheet inserted.

Descriptors: *Economic development, *Oilseed crops, *Food processing, Flax plants, Manufacturing, Economic impact, Feasibility, Marketing, Objectives, Technical assistance, Variable costs, Prices, North Dakota.

Identifiers: *Sunflower plants.

The purpose of this report was to explore the economic feasibility of establishing processing facilities for oil-type sunflowers in North Dakota. A broad set of topics was covered because production, processing and marketing of sunflowers and sunflower products in the U.S. are relatively recent. Historical sunflower production patterns were presented, together with two estimates of future production. One estimate was based on an attitudinal survey of farmers and a second on a maximum long-run projection for North Dakota. The supply of whole seed sunflowers from current and the two projections was related to processing requirements for each of the four plant sizes. The economic impact of each of the model sunflower processing plants on multicounty regions in which they might locate was estimated for the construction and operational phases.

PB-266 300/3

PC A06/MF A01

ACTION/Peace Corps, Washington, D.C.

The Photonovel: A Tool for Development

Program and training journal manual series

Daniel Weeks, and Eliza Sola. Sep 76, 113p

Rept no. Manual Ser-4

Descriptors: *Public health, *Specialized training, *Documents, *Health education, Manuals, Toilet facilities, Construction, Developing countries, Rural areas, Populations, Photographs, Instructions, Information, Materials, Methodology, Ecuador.

Identifiers: *Photonovels, Rural populations, Developing countries, Peace Corps.

Since 1961 Peace Corps volunteers have worked at the grass roots level in developing countries to help peoples to use new ideas that utilize locally available resources. One approach that has proven effective is the photonovel, in which a series of pictures outlines a step by step process to achieve a community goal. In each picture a white 'balloon' contains dialogue and indicates the speaker. The photonovel has achieved results where other media have failed. The present material deals with sanitary facilities in Ecuador.

PB-266 332/6

PC A03/MF A01

National Bureau of Standards, Washington, D.C.

Center for Building Technology.

Building to Resist the Effect of Wind. Volume I. Overview

Building science series (Final)

N. J. Raufaste, R. D. Marshall, and S. A. Kliment.

May 77, 38p Rept no. NBS-BSS-100-1

Library of Congress catalog card no. 77-600013.

Prepared in cooperation with Kliment (Stephen A.), New York.

Also available in set of 5 reports PC E08, PB-266

331-SET.

Descriptors: *Residential buildings, *Wind pressure, Design criteria, Disasters, Construction materials, Construction management, Socioeconomic

status, Technology transfer, Bangladesh, Philippines, Jamaica, Developing countries.

Identifiers: Low rise buildings, Wind resistant structures.

This document presents the background, goals, procedures and results of a project to develop improved design criteria that would make low-rise buildings in developing countries better able to withstand the effects of extreme winds. The project stemmed from the belief that additional research on wind was needed to reduce loss of life and property, human suffering, disruption of productive capacity and costs of disaster relief. The 3 1/2 year project began in early 1973 and produced these results: the development of improved design criteria; a methodology for the estimation of extreme wind speeds; the development of wind tunnel modeling techniques; a heightened awareness of the wind problem and the need to guard against it; the emergence of useful working relationships between NBS/AID and public and private decision makers in developing countries subject to extreme winds, especially the Philippines, Jamaica and Bangladesh; and the documentation of important information in the areas of wind design speeds and pressure coefficients, economic forecasting, socio-economic and architectural concerns, and construction detailing practices. Also during the project, a program began in the training of professionals and technicians in developing countries to carry out wind measurements and analyses. In addition, methods to ensure transfer of information to user groups were employed.

PB-266 333/4

PC A03/MF A01

National Bureau of Standards, Washington, D.C. Center for Building Technology.

Building to Resist the Effect of Wind. Volume II. Estimation of Extreme Wind Speeds and Guide to the Determination of Wind Forces

Final rept. 1975

R. D. Marshall. Jul 75, 33p Rept no. NBS-BSS-

100-2

Grant PASA-TA(CE)-04-73

Prepared in cooperation with Kliment (Stephen A.), New York. Library of Congress catalog card no. 77-600013. See also Volume 1, PB-266 332.

Also available in set of 5 reports PC E08, PB-266 331-SET.

Descriptors: *Residential buildings, *Wind pressure, Design criteria, Disasters, Construction materials, Construction management, Socioeconomic status, Technology transfer, Bangladesh, Philippines, Jamaica, Developing countries.

Identifiers: Low rise buildings, Wind resistant structures.

This paper briefly describes some of the more common flow mechanisms which create wind pressures on low-rise buildings and the effects of building geometry on these pressures. It is assumed that the basic wind speeds are known and a procedure is outlined for calculating design wind speeds which incorporates the expected life of the structure, the mean recurrence interval, and the wind speed averaging time. Pressure coefficients are tabulated for various height-to-width ratios and roof slopes. The steps required to calculate pressures and total drag and uplift forces are summarized and an illustrative example is presented.

PB-266 334/2

PC A04/MF A01

National Bureau of Standards, Washington, D.C. Center for Building Technology.

Building to Resist the Effect of Wind. Volume III. A Guide for Improved Masonry and Timber Connections In Buildings

Building science series (Final) 1976

S. George Fattal, G. E. Sherwood, and T. L.

Wilkinson. May 77, 60p Rept no. NBS-BSS-100-3

Grant PASA-TA(CE)-04-73

Prepared in cooperation with Forest Products Lab., Madison, Wis. Library of Congress catalog card no. 77-600013. See also Volume 2, PB-266 333.

Also available in set of 5 reports PC E08, PB-266

331-SET.

Descriptors: *Residential buildings, *Wind pressure, Design criteria, Disasters, Construction materials, Construction management, Socioeconomic

SELECTED APPROPRIATE TECHNOLOGIES

status, Technology transfer, Bangladesh, Philippines, Jamaica, Developing countries.
Identifiers: Low rise buildings, Wind resistant structures.

This report investigates the use of connectors for masonry and timber elements in low-rise buildings. Connector characteristics and construction details that improve a building's response to extreme wind effects are given primary emphasis. Recommendations include improvements through better utilization of connector technology showing good feasibility of introduction in developing countries. The building systems considered in this study fall within the low to moderate cost category.

PB-266 335/9 PC A03/MF A01
 National Bureau of Standards, Washington, D.C.
 Center for Building Technology.
Building to Resist the Effect of Wind. Volume IV. Forecasting the Economics of Housing Needs: A Methodological Guide
 Building science series (Final) 1976
 Joseph G. Kowalski. May 77, 40p Rept no. NBS-BSS-100-4
 Grant PASA-TA(CE)-04-73
 Library of Congress catalog card no. 77-600013.
 See also Volume 3, PB-266 334.
 Also available in set of 5 reports PC E08, PB-266 331-SET.

Descriptors: *Residential buildings, *Wind pressure, Design criteria, Disasters, Construction materials, Construction management, Socioeconomic status, Technology transfer, Bangladesh, Philippines, Jamaica, Developing countries.
Identifiers: Low rise buildings, Wind resistant structures.

The Agency for International Development sponsored with the NBS, a 3 1/2 year research project to develop improved design criteria for low-rise buildings to better resist the effects of extreme winds. Housing is probably the single most important consumer good in most economies. Measuring the size of a region's unmet housing need is a first step to planning and implementing improvements in housing conditions. This report analyzes the concept of housing needs in an economic framework. A methodology for estimating and projecting housing needs at the regional level is developed. The methodology attempts to make explicit the income redistribution intent which is the core meaning behind the concept of housing needs. Project results are presented in five volumes. Volume 1 gives an overview of the research activities, accomplishments, results and recommendations. Volume 2 presents a methodology to estimate design wind speeds and a guide to determine wind forces. Volume 3 discusses a guide for improved use of masonry fasteners and timber connectors. Volume 4 furnishes a methodology to estimate and forecast housing needs at a regional level. Socio-economic and architectural considerations of the Philippines, Jamaica and Bangladesh are presented in Volume 5.

PB-266 336/7 PC A03/MF A01
 National Bureau of Standards, Washington, D.C.
 Center for Building Technology.
Building to Resist the Effect of Wind. Volume V. Housing in Extreme Winds: Socio-economic and Architectural Considerations
 Building science series (Final) 1976
 Stephen A. Kliment. May 77, 41p Rept no. NBS-BSS-100-5
 Grant PASA-TA(CE)-04-73
 Prepared by Kliment (Stephen A.), New York. Library of Congress catalog card no. 77-600013.
 See also Volume 4, PB-266 335.

Descriptors: *Residential buildings, *Wind pressure, Design criteria, Disasters, Construction materials, Construction management, Socioeconomic status, Technology transfer, Bangladesh, Philippines, Jamaica, Developing countries.
Identifiers: Low rise buildings, Wind resistant structures.

Typical socio-economic conditions in the Philippines, Jamaica, and Bangladesh are identified. These conditions include strong respect for traditional materials and methods of house construc-

tion, and suspicion of innovative forms and approaches; a rising proportion of urban poor who live in squatter settlements; and a rising ratio of inhabitants whose incomes are at a level where they cannot afford housing of any kind. The importance of land from a social standpoint is stressed. The report reviews the sites and services concept whereby low income persons are provided a site equipped with basic utilities but must erect and maintain a house upon it. Recommendations include: placement of buildings to exploit terrain; adherence to good practices in the configurations of the main elements of a house (these are shown by means of simple drawings); and use of cheap, strong and locally available materials.

PB-266 709/5 PC A02/MF A01
 New Mexico State Univ., University Park. Water Resources Research Inst.
Protein Production by Russian Thistle: Effects of Water and Nitrogen on Protein Yields
 Technical completion rept.
 James H. Hageman, and James L. Fowler. Mar 77, 20p WRR-085, OWRT-A-049-NMEX(2)
 Contract DI-14-34-0001-5032
 Prepared by New Mexico State Univ., University Park Dept. of Chemistry.

Descriptors: *Feeding stuffs, *Proteins, *Forage crops, *Water consumption, Droughts, Arid land, Yield, Toxic tolerances, Inorganic salts, Irrigation, Efficiency, Nutrients, Vegetation, Acclimatization, New Mexico.
Identifiers: *Salsola, *Water use.

The purpose was to determine whether Russian thistle (*Salsola* spp.) might have potential as either a protein source or a forage under conditions of restricted water. Salsola was chosen because it was reported to be a C4 plant which is efficient in water use, drought resistant, salt tolerant and because it had been used as a feed previously. These results compare favorably with alfalfa, which is the most widely grown forage in New Mexico.

PB-267 295/4 PC A06/MF A01
 Missouri Univ.-Rolla. Rock Mechanics and Explosives Research Center.
Rapid Excavation of Rock with Small Charges of High Explosives
 Final rept.
 George B. Clark, and Ronald R. Rollins. Nov 76, 121p BuMines-OFR-98-77
 Contract H0252052

Descriptors: *Tunneling, *Underground mining, *Blasting, Explosive charges, Blast loads, Detonators, Earth movement, Fragmentation.
Identifiers: *Rapid excavation, Air blast.

The purpose of this investigation was to determine the feasibility of designing and testing the elements of a small-charge blasting system that will eliminate, or reduce to acceptable levels, most of the undesirable features of current underground drill and blast systems, that is, (1) air blast, (2) ground vibrations, (3) flying fragments, (4) overbreak and fracture of surrounding rock, and (5) the cyclic nature of drill and blast operations. The experimentation was conducted in tunnels in granite, and the results indicated that the basic technical concepts of the project were achieved. The next step is to design, construct, and test a prototype machine.

PB-267 358/0 PC A02/MF A01
 National Inst. for Occupational Safety and Health, Cincinnati, Ohio. Div. of Technical Services.
Good Work Practices for Tannery Workers
 Apr 76, 25p Rept no. NIOSH-76/157

Descriptors: *Industrial hygiene, *Tanning materials, Safety, Hazards, Methodology, Chemical compounds, Accident prevention, Recommendations, Personnel management, Leather, Processing.
Identifiers: Precautions, *Tanning industry, Occupational safety and health.

The booklet contains occupational health and safety information for tannery workers. Common hazards are identified and safe work practices sug-

gested. Chemicals used in a tannery are listed along with precautions to take when using them.

PB-267 949/6 PC A03/MF A01
 Economic Research Service, Washington, D.C.
 National Economic Analysis Div.
Spain's Leather Industry: Prospects for Blue Chrome (Wet-Blue) Processing
 Final rept.
 Antonio Del Valle Pintos, and Harold H. Taylor. May 77, 41p Rept no. AGERS-30
 Grant NSF-AG-482
 Prepared in cooperation with Instituto Nacional de Investigaciones Agrarias, Zaragoza (Spain). Dept. of Economics and Sociology.

Descriptors: *Spain, *Tanning materials, *Industrial wastes, *Water pollution control, Manufacturing, Substitution, Employment, Hides, Cattle.
Identifiers: Wet blue leather, *Leather industry.

Rapid expansion of the Spanish leather-goods industry has created a serious problem of pollution from tannery effluents. The use of chrome (wet-blue) leather in Spanish tanneries would reduce the pollution caused by cleaning and dehairing of conventional salt-cured hides. It would also reduce the number of workers required in tannery beam-houses, where cleaning occurs. Responding to a 1976 survey, tanners who produced about 80 percent of Spain's finished leather output said they would increase imports of blue chrome leather provided uniform grades and standards could be established to reduce the variability of quality. Tanners estimated that elimination of the beam-house operation might reduce hide finishing costs by 15 percent, and thus most would not be willing to pay more than 15-percent price premium for wet-blue hides. The tanners also indicated that if pollution laws were enforced, they would be more willing to substitute blue chrome for salt-cured hides since this substitution would reduce the beamhouse operation. Any change in demand for blue chrome hides would affect the United States, which supplies about one-fifth of Spain's hide imports.

PB-267 970/2 PC A04/MF A01
 Integrative Design Associates, Inc., Washington, D.C.
Appropriate Technology-A Directory of Activities and Projects
 1977, 75p NSF/RA-770064
 Grant NSF-ERS76-21350

Descriptors: *Regional planning, *Directories, Ecology, Ecological succession, Technology, Resources, Utilization, Conservation, Waste management, Recommendations, Environmental surveys, Data acquisition, Problem solving, Constraints, District of Columbia, Research projects, Research. Identifiers: Waste recycling.

This is a directory of United States activities in appropriate technology-technology that incorporates a concern for maintenance of the ecological balance by increasing the use of renewable resources, extending recycling and diminishing waste, and fostering the resource independence of local areas. The authors survey the field to learn from individuals and groups about the scope of their activities, the legal and technical problems they are facing in moving from idea to application, and their recommendations for federal activity in support of appropriate technology. This directory is, in part, a compilation of the descriptions of activities of the survey respondents. The descriptions of activities are extracted from a survey sent to individuals and groups as part of this project. Opinions on major obstacles to the further development of appropriate technology are noted.

PB-268 124/5 PC A07/MF A01
 National Research Council, Washington, D.C.
 Board on Science and Technology for International Development.
Leucaena: New Forage and Tree Crop for the Tropics
 Final rept.
 Jul 77, 126p* Rept no. CIR/BOSTID-77/24
 Contract AID/csd-2584

SELECTED APPROPRIATE TECHNOLOGIES

Prepared in cooperation with Philippine Council for Agriculture and Resources Research, College. Text in English, Resume in French and Spanish.

Descriptors: *Leguminous plants, *Tropical regions, *Developing countries, Forage crops, Wood products, Structural timber, Wood pulp, Feeding stuffs, Trees(Plants), Erosion control, Vegetation, Esthetics.

Identifiers: *Leucaena leucocephala.

The report describes Leucaena leucocephala, a little-known Mexican plant with bushy and tree-type varieties that produce nutritious forage, firewood, timber, paper pulp, and organic fertilizer. Its diverse uses also include revegetating hillslopes and providing firebreaks, shade, and city beautification.

PB-268 161/7 PC A06/MF A01

George Washington Univ., Washington, D.C. Graduate Program in Science, Technology, and Public Policy.

IRRI Small Agricultural Machinery Project: US Technology Transfer to Resource-Poor Developing Countries

Final rept.

Ann Becker, and Carol A. Ulinski. Dec 75, 103p NSF/PRA-19893/3/7

Contract NSF-STP74-19893

Continuation of Grant NSF-ST-44205. See also PB-268 001 and PB-268 002.

Descriptors: *Agricultural machinery, *Developing countries, *Technology transfer, Projects, Research, Development, Fabrication, Utilization, Farms, Government policies, Philippines, Performance evaluation, Foreign aid.

This study focuses on the results of the IRRI Small-Scale Agricultural Machinery Project in the Philippines, supported initially by the US Agency for International Development (AID). It examines three main stages of activity: research and development, manufacturing, and adoption of machinery by the farmers. It also studies Philippine Government policies in the light of the Project's objectives and mechanisms to facilitate linkages between each of the stages. The study assesses the success of the Project in terms of the amount of indigenization of problem-solving capabilities which has been achieved to date.

PB-268 185/6 PC A05/MF A01

Michigan State Univ., East Lansing. Dept. of Agricultural Economics.

Employment, Efficiency and Income in the Rice Processing Industry of Sierra Leone

African rural economy paper Dunstan S. C. Spencer, Ibi I. May-Parker, and Frank S. Rose. 1976, 92p Rept no. AREP-15

Prepared in cooperation with Njala Univ. Coll. (Sierra Leone). Dept. of Agricultural Economics and Extension.

Descriptors: *Rice, *Food processing, *Economic development, *Developing countries, *Sierra Leone, Policies, Flour mills, Manpower utilization, Capitalized costs, Employment, Income, Prices, Input, Output, Operating costs, Transportation, Mathematical models, Tables(Data), North Africa.

In West Africa the rice processing technologies range from traditional hand pounding to large mechanical mills. Because these technologies have varying factor intensities and output efficiencies the choice of technology in any country will have important effects on factor utilization, particularly employment, and on output. In Sierra Leone the government is currently considering whether investment should be directed to rehabilitation of three existing large mills, purchase of new large mills or encouragement of private investment in small mills including the location of these mills. The specific objectives of this study are: To describe and analyze the traditional and modern techniques of processing rice in Sierra Leone; and to develop a methodology to analyze the employment and income effects of policies.

PB-268 493/4 PC A07/MF A01

Michigan State Univ., East Lansing. Dept. of Agricultural Economics.

The Economics of Rural and Urban Small-Scale Industries In Sierra Leone

African rural economy paper Carl Liedholm, and Enyinna Chuta. 1976, 142p Rept no. AREP-14

Prepared in cooperation with Njala Univ. Coll. (Sierra Leone). Dept. of Agricultural Economics and Extension.

Descriptors: *Economic development, *Developing countries, *Industries, *Sierra Leone, Economic surveys, Rural areas, Urban areas, Policies, Factor analysis, Output, Employment, Data acquisition, Economic analysis.

This report summarizes and describes the major findings and conclusions of our research on small industry in Sierra Leone. The primary objectives of the research were to provide a descriptive profile of small-scale in Sierra Leone, to analyze the key determinants of the demand for and supply of output and employment generated by these industries, and to examine the efficacy of the major policies influencing small-scale industries. The problem setting discussed, followed by an examination of the most important empirical and analytical issues relating to small-scale industries. One section examines the major policy implications of the research.

PB-268 810/9 PC A14/MF A01

Colorado Univ., Boulder. Dept. of Civil and Environmental Engineering.

Segregation and Reclamation of Household Wastewater at an Individual Residence

Master's thesis Craig Carroll Withee. 1975, 309p OWRT-A-021-COLO(4)

Contract DI-14-31-0001-5006, Grant EPA-T-

900116

Descriptors: *Sewage disposal, *Sewage treatment, *Waste water reuse, Rural areas, Mountains, Residential buildings, Activated carbon treatment, Decomposition, Anaerobic processes, Aerobic processes, Water pollution abatement, Filtration, Biochemical oxygen demand, Separation, Detergents, Toilet facilities, Efficiency, Field tests, Theses, Colorado.

Identifiers: *Household wastes.

Disposal of wastewater from isolated homes in mountainous and rural locations in Colorado presents unique and difficult problems. The purpose of the study was to evaluate the flow and pollution patterns from individual homes and to evaluate existing and potential treatment methods. Field evaluation of home wastewater flow and pollutant characteristics was accomplished. The average per capita water use in the home was 44.4 gallons per day and the waste strength was 0.11 pounds per capita per day of BOD. Data for individual fixtures and appliances were obtained with measurement of many pollutant parameters. A brief evaluation of the home treatment methods was accomplished. Laboratory bench scale studies were made to evaluate methods for treatment of the soap related wastes in the home for reuse as toilet flushing water.

PB-268 820/8 PC A03/MF A01

Colorado State Univ., Fort Collins. Environmental Resources Center.

Soil and Rock Strata to Trap, Filter, and Store Water for Rural Domestic Use

Technical completion rept. Arthur T. Corey, and George L. Smith. Dec 76, 46p OWRT-C-6176(5219)(1)

Contract DI-14-31-0001-5219

Descriptors: *Ground water recharge, *Water supply, *Arid land, Aquifers, Rainfall, Runoff, Construction, Water storage, Potable water, Earth dams, Soils, Gravel, Dikes, Filtration, Terrain, American Indians, New Mexico, South Dakota.

Identifiers: *Artificial recharge.

Experimental rock and soil strata for collection, filtration and storage of rainfall and runoff water were constructed on three separate Indian Reser-

vations: Ramah Navajo, Santa Clara Pueblo in New Mexico, and the Pine Ridge (Oglala Sioux) in South Dakota. The artificial spring strata were constructed to determine their potential in the development and use of Indian and other lands located in the arid and semi-arid sections of the country where the availability of adequate water supplies for domestic use, for watering livestock in otherwise suitable grazing areas, and for the production of food crops is either severely limited as surface water, or the groundwater is non-existent, excessively saline, or at very great depths. The principle objective was to provide a reliable source of potable water at a relatively low cost. The most important factors in the construction of the experimental strata were site location, techniques of construction of the facility, selection of strata material and method of placement of impermeable layer.

PB-268 987/5 PC A05/MF A01

ACTION/Peace Corps, Washington, D.C. Office of Multilateral and Special Programs.

Freshwater Fisheries: Program Planning

Program and training Journal manual series Steven Gregory. Mar 77, 79p Rept no. Manual Ser-1A

Descriptors: *Aquaculture, *Fresh water fishes, *Developing countries, Instructional materials, Feasibility, Project planning, Fisheries, Personnel development, Job analysis, Ponds, Site surveys, Breeding, Growth, Maintenance, Recommendations, Manuals.

Identifiers: Zaire Republic.

The report is designed for policy-makers, program planners, trainers, and coordinators who are considering the potential contribution of fresh water fisheries to the people for and with whom they work. It describes in detail intensive fish culture in warm fresh water bodies, particularly artificially constructed fishponds. It is based on Peace Corps experiences, but applicable to a wider audience.

PB-268 988/3 PC A06/MF A01

ACTION/Peace Corps, Washington, D.C. Office of Multilateral and Special Programs.

Conseils de Sante' a la Famille Africaine (Health Advice for the African Family)

Program and training journal reprint series. Mar 77, 123p Rept no. Reprint Ser-21 Text in French.

Descriptors: *Health education, Developing countries, Instructional materials, Manuals, Pregnancy, Nutrition, Birth, Foreign countries, Africa.

Identifiers: Peace Corps, Infant health care.

The illustrated manual in simple French, provides materials for teaching about pregnancy and childbirth, infant nutrition and basic health precautions, and recipes for infants' meals.

PB-269 049/3 PC A05/MF A01

ACTION/Peace Corps, Washington, D.C.

Contabilidad para la Micro Empresa: Manual de Ensenanza (Accounting for the Small Business: Teaching Manual)

Program and training journal reprint series Michael W. Ronan. Apr 77, 90p Rept no. Reprint Ser-23 Text in Spanish.

Descriptors: *Accounting, *Manuals, *Businesses, Spanish language, Instructional materials, Developing countries.

Identifiers: Small businesses.

A teaching manual for small business accounting is prepared in Spanish text by a Peace Corps Volunteer in Colombia.

PB-269 257/2 PC A02/MF A01

General Accounting Office, Washington, D.C. Community and Economic Development Div.

Problems Affecting Usefulness of the National Water Assessment: Water Resources Council

23 Mar 77, 24p Rept no. CED-77-50

SELECTED APPROPRIATE TECHNOLOGIES

Descriptors: *Water supply, *Assessments, National government, State government, Objectives, Reviews, Accuracy, Reliability, Recommendations. **Identifiers:** *Water management(Administrative), Water Resources Planning Act of 1965.

The Water Resources Council, in compliance with the 1965 act, is now conducting the 1975 National Water Assessment in cooperation with Federal, state, and regional agencies. The ongoing assessment, started in calendar year 1974 and scheduled for completion by December 1977 at a cost of \$6.8 million, will determine water requirements, supply availability, and specific problems needing resolution at the national, regional, and subregional levels. The objective of this program is to give the executive branch of the Federal Government, through the Council, an analytical mechanism for appraising existing and proposed water and related land programs. With this program, the Council expects to be in a better position to make sound recommendations to the President and the Congress on allocating Federal resources to meet the Nation's critical water requirements.

PB-269 268/9 PC A05/MF A01
Johnson (Lawrence) and Associates, Inc., Washington, D.C.

Bicycle Safety Education: A Guide to Resources and Materials
Jun 77, 80p*
Contract CPSC-C-77-0027
Sponsored in part by Department of Transportation, Washington, D.C. Report on 'A National Bicycle Safety Education Conference Held at Washington, D.C. on May 4-6, 1977. See also PB-269 267.

Descriptors: *Education, *Bicycles, *Highway transportation, *Safety, *Meetings, *Instructional materials, Consumer affairs, Motor vehicle accidents, Traffic safety, Safety devices, Visual aids, Guidelines, Project management, Bibliographies. **Identifiers:** Curricula.

The guide contains all known print and audiovisual materials on bicycle safety education available in the U.S. This guide was developed for the Bike Ed. Conference of May 4-6, 1977. The guide contains stock numbers and prices to enable ordering of materials. The types of materials in the guide are: Curriculum Guides; Packaged Programs; Films and Filmstrips; Books; Booklets and Pamphlets; Research Reports; and Public Relations Materials. The appendices consist of examples of bicycles safety programs, sources of Federal funding and periodicals.

PB-269 550/0 PC A04/MF A01
General Accounting Office, Washington, D.C. Community and Economic Development Div.
Ground Water: An Overview
Report to the Congress.
21 Jun 77, 56p* Rept no. CED-77-69

Descriptors: *Ground water, *Conservation, *Water supply, Management, State government, National government, Arid regions, Salt water intrusion, Aquifers, Recommendations.

This report discusses the importance of ground water, problems involving ground water supplies, what is being done to manage ground water, and data needs—primarily in the arid and semi-arid States. Several questions regarding its management, conservation, and use warrant attention by the Congress and study by Federal and State agencies and others responsible for planning and administering water resources development.

PB-269 689/6 PC A04/MF A01
Sir J. J. Group of Hospitals, Bombay (India). Tata Dept. of Plastic Surgery.

A Comprehensive Rehabilitation Research and Demonstration Programme for Patients In an Urban Population

Final rept.
1975, 71p SRS-19-58139-001
Grant SRS-19-58139

Descriptors: *Rehabilitation, *Leprosy, Attitudes, Urban areas, Surgery, Social psychology, Vocational guidance, India, Developing countries.

A comprehensive research and demonstration project was undertaken in Bombay, India, to study the problems of the rehabilitation of lepers from the social, psychological, medical, and economic points of view. Psycho-social studies were conducted with the aim of reducing the stigma of leprosy. Medical studies developed and evaluated new techniques of dealing with the physical problems of lepers' hands and feet. Lepers were directly prepared for job training, and industrialists came to better understand the problems of the handicapped in conferences with rehabilitation and medical professionals.

PB-269 892/6 PC A04/MF A01
General Accounting Office, Washington, D.C. International Div.

Restrictions on Using More Fertilizer for Food Crops In Developing Countries: Department of State and Other Federal Agencies
Report to the Congress.
5 Jul 77, 73p Rept no. ID-77-6

Descriptors: *Farm crops, *Fertilizers, *Developing countries, Production, Utilization, Food supply, Government policies, Technical assistance, Prices, Financing, Grants, Recommendations, Tables(Data).

This report is part of a continuing effort to recommend ways U.S. agencies can better help developing countries to improve their food situation. The report discusses the need for governments receiving foreign economic assistance to revise policies which act as constraints to increasing the use of fertilizer for food crops.

PB-270 038/3 PC A06/MF A01
American Public Health Association, Washington, D.C. International Health Programs.

The State of the Art of Delivering Low Cost Health Services In Developing Countries: A Summary Study of 180 Health Projects
Jan 77, 118p
Contract AID/csd-3423, AID/ta-c-1320

Descriptors: *Developing countries, *Health care delivery, Innovations, Populations, Medical services, Reviews, Health care services, Foreign countries, Health care costs, Projects, Health manpower education, Manpower utilization, Health education, Family planning, Nutrition, Health care facilities, Evaluation, Management, Promoting, Tables(Data). **Identifiers:** Maternal and child health services, Appendices.

Contents:
Project characteristics, activities and obstacles;
Health manpower training and utilization;
The delivery of health services;
The promotion of health-education, organizations and the environment;
Project planning and management;
Evaluation;
Innovations in the delivery of low-cost health services.

PB-270 095/3 PC A03/MF A01
Economic Development Administration, Washington, D.C. Office of Economic Research.

Comments on Kelso's 'Two Factor Theory' and Employee Stock Option Programs (ESOP's)
Working paper

Monroe Newman. Jul 76, 30p Rept no. EDA/OER-77/024

Descriptors: *Economic models, Political systems, Capital, Opinions, Income, Personnel, Productivity, Incentives, Consumption, Investments, Bargaining, Theories, Labor.

Identifiers: Capitalism, Kelso Louis O, Stocks and bonds, *Employee stock ownership plans, Income redistribution, *Two factor theory.

This essay critically examines the economics and institutional proposals of Louis O. Kelso. The author separates his treatment into three areas: (1) proposals for a wider dispersion of capital ownership; (2) economic theory underlying Kelso's analysis of modern capitalism; and (3) the normative

judgments made by Kelso about consumption, income distribution, and the purpose of economic activity. The author makes criticisms of Kelso's work in all three areas. Particular attention is given to employee stock ownership plans (ESOP's) as a way to fund pension plans and increase worker productivity.

PB-270 171/2 PC A04/MF A01
General Accounting Office, Washington, D.C. Community and Economic Development Div.
Water Resources Planning, Management, and Development: What Are the Nation's Water Supply Problems and Issues
28 Jul 77, 58p Rept no. CED-77-100

Descriptors: *Water resources, *Water supply, Management, Flood control, Research projects, Multiple purpose reservoirs, Irrigation, Recreation, Government policies, Industries, Benefit cost analysis, Allocations, Electric power plants, Municipalities, Rural areas, Water rights, Legislation, Water quality, Agriculture, Water conservation. **Identifiers:** Priorities, *Water demand, *Water management(Administrative).

The focus of the water and water-related programs area is on those programs and activities concerned with water resources planning, management, and development projects designed to provide adequate water supplies to meet present and future demands. Water resources planning encompasses assessing the quantity and quality of available water supplies, forecasting future water demands, analyzing existing and potential water supply problems, and preparing proposals for resolving such problems. Water resources developments may be single-purpose flood control, navigation projects, or multiple-purpose dam and reservoir projects which may provide for hydroelectric power generation, flood control, recreational activities, and water supplies for irrigated agriculture as well as for domestic and industrial uses. The study is primarily directed to Federal programs, but also covers non-Federal activities.

PB-270 607/5 PC A04/MF A01
Hawaii Univ., Honolulu.
Report of the Workshop on Experimental Designs for Predicting Crop Productivity with Environmental and Economic Inputs Held at Honolulu, Hawaii on May 20-24, 1974
J. A. Silva, and F. H. Beinroth. May 74, 58p
Sponsored in part by Agency for International Development, Washington, D.C. Prepared in cooperation with Puerto Rico Univ., Mayaguez.

Descriptors: *Farm crops, *Tropical regions, *Developing countries, Production, Yield, Soil properties, Fertilizers, Irrigation, Experimental design, Research projects, Universities, Research management.

The Universities of Hawaii and Puerto Rico have formulated two projects with the assistance of United States, Agency for International Development (USAID) to undertake some of the necessary research and to design an extension delivery and communications system that will hasten the application of tropical agricultural research. The purposes of the projects are to correlate food crop yields on a network of benchmark soils, and to determine scientifically the transferability of agro-production technology among tropical countries. The workshop, which is the basis of the report, was held to discuss and hopefully to agree upon the experimental designs and research methodology that would be used in the crop production research in these two projects.

PB-270 775/0 PC A04/MF A01
Missouri Univ.-Rolla. Dept. of Civil Engineering.
Control of Algae In Lakes, Lagoons and Small Reservoirs with Biogrowth Partitions
Completion rept. Jul 74-Jun 76
Bobby G. Wixson, Donald E. Modesitt, Paul Han Cheng, and Walter H. Zachritz. Jun 77, 60p
OWRT-A-077-MO(2)
Contract DI-14-31-0001-5025, DI-14-31-0001-6026

SELECTED APPROPRIATE TECHNOLOGIES

Descriptors: *Algae, *Pest control, *Lakes, *Reservoirs, *Sewage treatment, Lagoons(Ponds), Growth, Waste water, Oxygen, Dissolved gases, Carbon dioxide, Tanks(Containers), Effectiveness, Design, Biochemical oxygen demand, Field tests. Identifiers: *Biogrowth partitions, Eutrophication.

Research was carried out on the control of algae from small lagoons through laboratory and field studies of manmade biogrowth surfaces for removing or controlling algae. Three lab-scale stabilization lagoons were modified with the addition of biogrowth sheets and operated with 30-day and 15-day detention period. Principal parameters measured were COD, suspended solids, dissolved oxygen, pH, carbon dioxide, and microbial populations. Experimental laboratory results indicated that the application of biogrowth sheets was effective for lagoon stabilization. The practicability and design characteristics of the lagoon modification were then evaluated in field investigations.

PB-271 002/8 PC A08/MF A01
Missouri Univ.-Columbia. Agricultural Experiment Station.
The Agricultural Development of Nicaragua: An Analysis of the Production Sector
Special rept.
Philip F. Warnken. Jul 75, 172p Rept nos. SR-168, International Ser-1

Descriptors: *Agricultural economics, *Developing countries, *Nicaragua, Farms, Production, Trends, Land use, Manpower, Cost analysis, Farm crops, Income, Livestock, Market value, Fertilizers, Agricultural machinery, Statistical data.

This study presents a benchmark descriptive analysis of agricultural production in Nicaragua. The purpose was to provide an analytical basis whereby priorities for general and specific agricultural policies could be established to further Nicaraguan developmental objectives in the agricultural sector. The study was limited to an analysis of principal agricultural products in Nicaragua and included nine crops and two livestock activities. These activities were grouped into three classes of products: (1) basic grains including corn, beans, rice and grain sorghum; (2) export products including cotton, coffee, sugarcane, tobacco and sesame; and (3) livestock activities which included the beef and dairy enterprises. Together, these activities accounted for over 90 percent of the total value of production from the agricultural sector in 1971. The analysis was further limited to production from the six major regions which lie in the western half of the country. The two eastern regions bordering the Caribbean were excluded from the study since both are economically unimportant in terms of national agricultural output.

PB-271 392/3 PC A03/MF A01
Georgia Inst. of Tech., Atlanta. Economic Development Lab.
Pyrolytic Conversion of Agricultural and Forestry Wastes in Ghana - A Feasibility Study
Jul 76, 47p
Contract AID/ta-C-1290
Prepared in cooperation with Council for Scientific and Industrial Research, Kumasi (Ghana). Building and Road Research Inst., and Technology Consultancy Center, Kumasi (Ghana).

Descriptors: *Agricultural wastes, *Wood wastes, *Pyrolysis, *Fuels, *Ghana, Reclamation, Solid waste disposal, Charcoal, Manufactured gas, Fuel oil, Design, Combustion chambers, Cost estimates. Identifiers: Appropriate technology.

This report describes the results of a field study to determine the quantities and characteristics of waste in Ghana and the feasibility of using pyrolytic conversion of these wastes. The study shows that Ghana is generating 2,735,100 tons of agricultural and forestry waste materials each year that are suitable for pyrolytic conversion. Using pyrolytic conversion of all these waste materials, approximately 342,000 tons of charcoal and perhaps 273,000 tons of oil could be produced. The market value of the end products would be about \$48,396,000 each year. A preliminary description

of an appropriate technology version of a continuous/batch pyrolytic conversion system is also presented in this report.

PB-271 714/8 PC A04/MF A01
Tennessee State Univ., Nashville.
A Complete Disposal-Recycle Scheme for Agricultural Solid Wastes
Final rept. Jan 74-Jun 76
Michael R. Busby, Greg Tragitt, Roland Norman, and Kenneth Hillsman. May 77, 62p EPA/600/2-77/089
Contract EPA-R-802739

Descriptors: *Solid waste disposal, *Agricultural wastes, *Anaerobic processes, *Reclamation, Methane, Fuels, Fertilizers, Feeding stuffs, Sludge disposal, Animal nutrition, Chemical analysis, Sampling, Process charting, Performance evaluation. Identifiers: Manure, Waste recycling.

This investigation applied the anaerobic process to the production of methane gas and a stabilized sludge from cow manure and farm clippings in laboratory pilot plants as well as a full-scale (2,000 gal.) digester system. The quantity and quality of gas produced, the biochemical and chemical oxygen demands, and the nutritional value of the digested sludge for both the laboratory and full-scale plants were evaluated.

PB-271 739/5 PC A04/MF A01
General Accounting Office, Washington, D.C. Community and Economic Development Div.
More and Better Uses Could Be Made of Billions of Gallons of Water by Improving Irrigation Delivery Systems: Department of Agriculture and the Interior
Report to the Congress.
2 Sep 77, 53p Rept no. CED-77-117

Descriptors: *Water supply, *Distribution systems, *Irrigation, Federal assistance programs, Water loss, Seepage, Requirements, Agriculture, Electric power plants, Recreation, Irrigation canals, Ground water, Improvement, Litigation, Research projects, Recommendations, Financing. Identifiers: *Water conveyance.

Billions of gallons of water seep from inefficient irrigation delivery systems in the western states. By reducing such seepage, more water could be available for crop irrigation, energy development, environment improvement, and recreation. This report discusses opportunities to administer better the Federal programs providing the funds for water conveyance system improvements and the benefits to be derived.

PB-271 847/6 Not available NTIS
National Bureau of Standards, Washington, D.C.
Adobe Building Materials: Properties, Problems, and Preservation
Final rept.
J. R. Clifton. 1977, 4p
Pub. in Tech. Conservation, p30-34 Spring 77.

Descriptors: *Construction materials, *Residential buildings, Soils, Bricks, Fabrication, Molding techniques, Sunlight, Research, Preserving. Identifiers: *Adobe brick, Reprints.

Earth, air, and water--three of the four elements of the ancient world--have been combined for several millennia to form a versatile building material. This product, sun-dried earth bricks, or adobe, was easy to make and use in pre-industrialized societies. No great technical skill or equipment was necessary. Fabrication required only mixing soil and water, shaping the mixture into forms, and exposing them to the atmosphere to set them. Once hardened, the bricks were ready to use. The National Bureau of Standards is studying the properties of adobe to determine what problems may be associated with it, and how best to preserve adobe in old buildings.

PB-272 005/0 PC A05/MF A01
General Accounting Office, Washington, D.C. Community and Economic Development Div.

Food Waste: An Opportunity to Improve Resource Use: Department of Agriculture
Report to the Congress.
16 Sep 77, 84p* Rept no. CED-77-118

Descriptors: *Food, *Wastes, *Resources, Food consumption, Food supply, Production capacity, Food industry, Management, Consumer affairs. Identifiers: *Food wasting, Department of Agriculture.

The report discusses the Department of Agriculture's past and current activities concerning food loss in the United States, as well as a broader assessment of loss. Study results indicate that about one-fifth of all food produced for human consumption is lost annually in the United States. In the world context of rising population, uncertain weather, and concern with the availability of resources, every opportunity should be taken to improve food system management in this country. More attention should be directed at the causes of food waste, new management technology for reducing loss, and improvement of consumer understanding.

PB-272 129/8 PC A06/MF A01
Boise Center for Urban Research, Idaho.
Analysis of Alternatives to Refuse Disposal
Final rept.
Jim Baker, Mike Bowlin, Carol Hansberger, and Phil Hanson. May 77, 104p UO-LCCM-BOI-77-009, HUD/RES-1140
Prepared in cooperation with League of Cities-Conference of Mayors, Inc., Washington, D.C., Contract HUD-H-2196R.

Descriptors: *Solid waste disposal, *Management planning, Garbage, Sanitary landfills, Reclamation, Materials recovery, Land use, Refuse disposal, Marketing, Separation, Site surveys, Paper, Metals, Iron, Aluminum, Wood wastes, Plastics, Leather, Incinerators, Biodegradation, Fuels, Water pollution control, Government policies, Regulations, Geology, Demography, Cost analysis, Financing, Idaho. Identifiers: Ada County(Idaho), Waste recycling, Pyrolysis incineration, Refuse derived fuels, Source separation.

The researchers reviewed six alternative solid waste methods. The six alternatives considered were: continued landfill; household or source separation; pyrolysis; biodegradation; waste-based solid fuel production; incineration. The use of a sanitary landfill is virtually unavoidable now and in the near future. Whatever plan or alternative is adopted for Ada County, a certain percentage of waste or amount of residue will ultimately end up in a landfill. It is at the present, the most practical, least-cost method of disposing of garbage. However, the sanitary landfill is not without problems. For instance, the Hidden Hollow Sanitary Landfill, Ada County's primary landfill site, opened in 1971 and was expected to last up to 1986. However, due to an increasing volume of garbage, the life expectancy has been shortened and the closing date is now estimated to be about 1980. As citizens become familiar with more sanitary and productive methods of disposing and/or utilizing solid waste, traditional landfill techniques will become less acceptable. Also, as the cost of energy escalates, landfill will not be cost effective compared to processes that recover materials or energy from solid waste. (Portions of this document are not fully legible)

PB-272 651/1 PC A06/MF A01
Virginia Polytechnic Inst. and State Univ., Blacksburg. Coll. of Agriculture and Life Sciences.
Evaluation of Investment Opportunities: Tools for Decisionmaking in Farming and Other Businesses
Final rept.
Arthur J. Walrath. Jun 77, 108p* Rept no. AH-349
Sponsored in part by Economic Research Service, Washington, D.C. Economic Development Div.

Descriptors: *Farm management, *Investments, *Decision making, Return on investment, Costs, Fixed investment, Discounted cash flow, Savings, Profits, Computation, Tables(Data).

SELECTED APPROPRIATE TECHNOLOGIES

This report offers business managers, including farmers, easy-to-use guides for analyzing investment opportunities. Examples show how to classify and compare various costs and returns. Formulas are given which can be applied to business decisions. They emphasize the time-value concept of money by using compounding and discounting methods. Tables are presented for determining the future value of a present sum, present value of a present sum, and present and future values of annuities. Although aimed at the businessman, the handbook can also be used to make household decisions: one example shows how much has to be saved each month to reach a savings goal in five years.

PB-272 681/8 PC A20/MF A01
Industrial Environmental Research Lab., Cincinnati, Corvallis, Oreg. Food and Wood Products Branch.

Proceedings of National Symposium on Food Processing Wastes (8th) held on March 30 - April 1, 1977 in Seattle, Washington
Aug 77, 463p* Rept no. EPA/600/2-77/184

Descriptors: *Food processing, *Meetings, *Water pollution control, Filtration, Brines, Revisions, By-products, Materials recovery, Industrial waste treatment, Guidelines, Canneries, Sludges, Anaerobic process, Standards, Water pollution control, Odor control, Lagoons(Ponds), Assessments, Residues, Seafood, Tomatoes, Fruits, Vegetables, Feedstocks, Proteins, Dairy, Poultry, Preservatives. Identifiers: Water reuse, Meat packing industry, Biological industrial waste treatment.

The Proceedings contains copies of 29 of the 31 papers presented at the Eighth National Symposium on Food Processing Wastes. Subjects included: processing modifications, product and by-product recovery, wastewater treatment, water recycle and water reuse for several segments of the food processing industry. These segments included: red meat and poultry, seafood, dairy, fruit, and vegetable. Attendance at the two and one-half day Symposium was approximately 200 with good representation by industry, universities, consulting firms, as well as state and Federal agencies.

PB-272 702/2 PC A03/MF A01
Robert S. Kerr Environmental Research Lab., Ada, Okla.

Environmental Effects of Septic Tank Systems
Rept. for 1976-77

Marion R. Scalf, William J. Dunlap, and James F. Kreissl. Aug 77, 43p* Rept no. EPA/600/3-77/096

Descriptors: *Septic tanks, *Sewage disposal, *Water pollution abatement, Environmental impacts, Adsorption, Rural areas, Mountains, Ground water, Surface waters, Design, Regulations, Water pollution control, Sludge disposal, Leaching, Trends, Water wells, Oklahoma. Identifiers: Remote areas.

Septic tank-soil absorption systems are the most widely-used method of on-site domestic waste disposal. Almost one-third of the United States population depends on such systems. Although the percentage of newly constructed homes utilizing septic tanks is decreasing, the total number continues to increase. Properly designed, constructed, and operated septic tank systems have demonstrated an efficient and economical alternative to public sewer systems, particularly in rural and sparsely developed suburban areas. However, because of their widespread use in unsuitable situations, they have also demonstrated the potential for contamination of ground and surface waters.

PB-272 835/0 PC A08/MF A01
Illinois Univ. at Chicago Circle. Dept. of Materials Engineering.

Ferrocerment in Bending, Part II: Fatigue Analysis
Final rept. 1974-77
P. Balaguru, A. E. Naaman, and S. P. Shah. Oct 77, 167 Rept no. 77-1
Grant NSF-ENG74-20829
See also report dated Aug 76, PB-262 155.

Descriptors: *Concretes, *Fatigue(Materials), Loads(Forces), Reinforcing materials, Rigidity, Cracks, Fatigue life, Creep properties. Identifiers: Ferrocement.

This report follows Part I PB-262 155 which dealt with monotonic loading. In this report analytical and experimental investigations of ferrocement beam subjected to fatigue flexural loading are described. Based on experimental results, empirical formulae are suggested to predict fatigue life, and deflections and crack widths for a given number of cycles and loading. These formulae also seem to be applicable to conventionally reinforced concrete beams. In addition, based on the fatigue properties of the constituent materials: steel and concrete, a theoretical model was developed to predict behavior of ferrocement composited subjected to fatigue loading.

PB-272 908/5 PC A11/MF A01
National Water Well Association, Worthington, Ohio.

Proceedings of the National Ground Water Quality Symposium (3rd) Held in Las Vegas, Nevada on September 15-17, 1976

Final rept. 31 Mar 76-31 Jan 77.
Jun 77, 240p* EPA/600/9-77/014
Contract EPA-68-03-2396

Descriptors: *Ground water, *Water pollution, *Meetings, Land use, Potable water, Waste disposal, Subsurface drainage, Ground water recharge, Las Vegas Valley, Sewage disposal, Industrial wastes, Soil water, Ponds, Linings, Permeability, Seepage, Water table, Design criteria, Arid land, Nitrogen, Earth fills. Identifiers: Ground water movement, Artificial recharge, Sewage irrigation, Vadose zone.

The Third National Ground Water Quality Symposium was held in Las Vegas, September 15-17, 1976, in conjunction with the annual convention of the National Water Well Association. There were eight main sessions encompassing twenty-four technical papers. These were concerned with the disposal of waste on the land, the movement of pollutants in the subsurface, and artificial recharge. A special session was dedicated to ground water in the Las Vegas Valley.

PB-273 099/2 PC A04/MF A01
Integrative Design Associates, Inc., Washington, D.C.

Appropriate Technology in the United States--An Exploratory Study
Eugene Eccl. 1977, 59p NSF/RA-770066
Grant NSF-ERS76-21350

See also PB-267 970. Prepared in cooperation with Design Alternatives, Inc., Washington, D.C.

Descriptors: *Research projects, *Technology innovation, Regional planning, Ecology, Resources, Utilization, Conservation, Waste management, Environmental surveys, Problem solving, Constraints, Universities, Industries, Scientists, Professional personnel, Barriers, Technology transfer, Quality of life. Identifiers: Appropriate technology.

The study surveys those in the United States currently active in the field of appropriate technology, describes their efforts, explores factors inhibiting the development and application of their innovations, reports on their recommendations for Federal and National Science Foundation activities in support of appropriate technology, and assesses the policy implications of appropriate technology in relation to an environmentally and resource constrained economy. Two hundred and ninety-four individuals and groups from target populations concerned with issues related to the environment, local participation in planning and technology development, and unemployment/income stabilization responded to the survey. This report explains the methodology used to elicit and interpret information; presents the background information about the respondents; reports on major issues of several innovator constituencies; analyzes the survey experience and examines the social and economic trends in both the U.S. and the developing countries which are related to appropriate technology.

PB-273 264/2 PC A06/MF A01
Corvallis Environmental Research Lab., Oreg.

Biological Control of Aquatic Nuisances - A Review
Final rept.

Gerald S. Schuytema. Jul 77, 101p* Rept no. EPA/600/3-77/084

Descriptors: *Aquatic weeds, *Weed control, Reviews, Cyanophyta, Viruses, Fungi, Bacteria, Fishes, Snails, Phytoplankton, Zooplankton, Competition, Damage, Ecology, Algae. Identifiers: Biomanipulation, Biological insect control, Eutrophication, Water hyacinths, Alligator weeds, Agasicles, Neochetina, Predation, Tilapia.

A total of 532 references on the biological control of aquatic nuisances were reviewed. Three major control approaches exist. Grazing and predation have been the most frequently utilized techniques, with emphasis on macrophyte control by fish and insects. The use of pathogens is potentially effective, with most promise in macrophyte control. Biomanipulation, the exploitation of the interrelationships among plants and their environment is a most promising technique for eutrophic systems. This approach includes increasing algal grazers while controlling zooplanktivores and exploiting the competitive and growth limiting reactions among various species. The importance of using host-specific organisms to prevent damage to desirable components of the ecosystem is emphasized.

PB-273 450/7 PC A05/MF A01
Texas A and M Univ., College Station, Dept. of Agricultural Economics and Rural Sociology.

Economic Responses to Market Risks in Agriculture. Proceedings of a Seminar Sponsored by Western Regional Coordinating Committee-16 and Task Force 8 of NCRR-1, Held at St. Louis, Missouri on November 13, 14, 1975
Peter J. Barry, and C. B. Baker. Nov 75, 92p

Prepared in cooperation with Illinois Univ. at Urbana-Champaign. Dept. of Agricultural Economics.

Descriptors: *Agricultural economics, *Meetings, Farm management, Risk, Economic factors, Management.

To initiate inquiry into research priorities in risk management, a seminar was sponsored on Economic Responses to Market Risks in Agriculture held in November 1975. The seminar speakers were comprised of representatives from agricultural production, farm-related markets, and financial institutions. Their backgrounds were diverse reflecting various stages in the food system as well as reflecting proprietor and corporate interests in the case of market firms, and banking and cooperative lending in the case of financial institutions. These speakers represented their recent experiences and problems in managing market risks in agriculture and provided guidance for research needed to improve risk management. Viewpoints from rural sociology and agricultural policy were also provided. (Portions of this document are not fully legible)

PB-273 529/8 PC A08/MF A01
Arizona Univ., Tucson. Office of Arid Lands Studies.

The Application of Technology in Developing Countries
Rept. for Aug-Dec 76

Robert L. Bulfin, Jr. and J. Richard Greenwell. 1977, 172p

Contract AID/tA-6-1111
Papers presented during an Interdisciplinary Programs Seminar Series, August-December 1976.

Descriptors: *Technology transfer, *Developing countries, *Meetings, Technology assessment, Food industry, Water resources, Agriculture, Engineering. Identifiers: Appropriate technology.

The chapters in this volume are based on papers delivered during a weekly seminar series at the University of Arizona between September and December, 1976. These seminar series were originally held under the auspices of the University's Natu-

SELECTED APPROPRIATE TECHNOLOGIES

ral Resources Program, an interdepartmental activity made possible by a 211(d) institutional grant to the University from the U.S. Agency for International Development; the seminars are now sponsored by the University's Office of Interdisciplinary Programs. The volume, like the original seminar series, represents the varying, and sometimes differing, views of specialists in such fields as industrial, civil, nuclear, agricultural, and systems engineering, physical geography, and cultural anthropology; these views also represent both the University of Arizona and other nationally-known institutions.

PB-273 572/8 PC A07/MF A01
General Accounting Office, Washington, D.C. International Div.
The Challenge of Meeting Shelter Needs in Less Developed Countries
Report to the Congress.
4 Nov 77, 135p Rept no. ID-77-39

Descriptors: *Developing countries, *Housing, Residential buildings, Housing deficiencies, Financial support, Loans, Disadvantaged groups, Low income groups, Banking business, Economic analysis, Shortages, International relations, United States, Latin America, Africa, Foreign countries. Identifiers: Agency for International Development, United Nations, World Bank.

This report describes the worldwide housing shortage and the shelter assistance efforts of the Agency for International Development, the multilateral lending institutions, private and voluntary organizations, and certain bilateral donors. This review was made to provide an overview of the world housing situation and to identify some of the problem areas in the planning and management of housing development assistance. The report makes recommendations to assist international donors, principally the Agency for International Development, in improving their efforts to provide shelter assistance to the less developed countries.

PB-273 752/6 PC A03/MF A01
Minnesota Agricultural Experiment Station, St. Paul.
World Market Conditions for Grains; Prospects and Problems, with Special Reference to the Developing Countries
Martin E. Abel. 1977, 29p Rept no. MISC-143

Descriptors: *Market surveys, *Grains(Food), *Developing countries, Production, Foreign countries, Marketing, Policies, International trade, Prices, Agriculture, Reserves, Consumption.

Dramatic changes in world grain prices since 1972 have caused serious questions to be raised about the level and stability of future grain prices. All countries are concerned with these questions, but they especially involve a large number of developing countries. Some developing countries are important grain exporters, and future world market conditions bear directly on their prospects for foreign exchange earnings and the ability to finance development. Many other developing countries are net grain importers and the behavior of grain prices in the future will affect the ability of these countries to import grain, insure domestic food price stability, and protect the nutritional well-being of large segments of their population. World market conditions for grains during the next 5 to 10 years could be highly uncertain, compared with conditions that prevailed in the 1950s and 1960s. This paper focuses on policy options which may be open to countries, individually or collectively, for dealing with uncertain market conditions. First, the evolution of the current world market situation for grains, the patterns of international trade in grains, and the basic problems that the current situation generates for different types of countries are discussed. Next, the future prospects for grain production, consumption, trade, and policy options for dealing with the future are examined. Finally, alternative mechanisms for implementing a variety of policy options are reviewed. The focus is on grains because they represent the basic category of food, worldwide, and are the most important form in which food is transferred among countries.

PB-274 436/5 PC A06/MF A01
Washington Univ., Seattle. Coll. of Fisheries.
Aquaculture in Southeast Asia. A Historical Overview
Shao-Wen Ling. 1977, 122p* CONTRIB-465, ISBN-0-295-95560-0, NOAA-77101207 Library of Congress Catalog Card No. 77-3828.

Descriptors: *Ponds, *Aquaculture, *Southeast Asia, Shelffish, Fisheries, Indonesia, Philippines, Malaysia, South Vietnam, North Vietnam, Cambodia, Harvesting, Developing countries, Economic development, Reproduction(Biology), Thailand, Burma, China, Coasts, Taiwan, Singapore. Identifiers: Sea Grant Program.

Aquaculture had its cradle in Asia. It developed there some four thousand years ago in harmony with a traditional rural-agrarian economy, and it is now heading towards some fascinating developments. Aquaculture in the Southeast Asian region, including Indonesia, the Philippines, Malaysia, Singapore, Vietnam, Cambodia, Thailand, Burma, and the southern China coast to Taiwan is examined. The species cultured in the area are identified and the collection and production of stocking material is explained. Culturing facilities are described and information is given on aquaculture practices and techniques.

PB-274 612/1 PC A08/MF A01
National Research Council, Washington, D.C. Board on Science and Technology for International Development.
Expansion des Ressources en Eau dans les Zones Arides, Techniques Prometteuses et Possibilités de Recherches (Expansion of Water Resources in Arid Regions. Promising Techniques and Opportunities for Research)
1977, 165p
Contract AID/csd-2584
Text in French.

Descriptors: *Water supply, *Arid land, *Developing countries, *Agriculture, Water conservation, Research projects, Water consumption, Social effect, Harvesting, Project planning, Runoff, Deserts, Reservoirs, Evaporation, Rainfall, Irrigation, Salinity, Water wells, Waste water. Identifiers: *Water harvesting, Research needs.

Little known but promising technologies for the use and conservation of scarce water supplies in arid areas are the subject of this report. Not a technical handbook, it aims to draw the attention of agricultural and community officials and researchers to opportunities for development projects with probable high social value. Each technology is presented in a separate chapter and arranged under the following topics: methods, advantages, limitations, stage of development, needed research and development, selected readings (a short list of reviews and general articles) and contacts (a list of individuals or organizations the panelists know to be involved in relevant research).

PB-274 715/2 PC A13/MF A01
Department of Transportation, Washington, D.C.
Proceedings of the National Symposium on Transportation for Agriculture and Rural America, Held at New Orleans, Louisiana, on November 15-17, 1976
John O. Gerald, Kenneth L. Casavant, Robert J. Tosterud, and William F. Brown. 1 Aug 77, 286p* Rept no. DOT-TST-77-33
Prepared in cooperation with Farm Foundation, Chicago, Ill., North Dakota State Univ., Fargo. Upper Great Plains Transportation Inst., and Cooperative State Research, Washington, D.C.

Descriptors: *Transportation, *Agricultural products, *Meetings, *Rural areas, International trade, Regulations, Economic impact, Services, Cargo transportation, Passenger transportation, Policies, Energy conservation, Research, Planning, United States. Identifiers: *Rural transportation.

There is growing concern about the appropriateness of national and state transportation planning, policies, and funding arrangements for maintaining an efficient and equitable transportation system in rural America. Symposium sessions were held on

the following topics: Transportation of agricultural commodities for international trade; impacts of transportation regulation on agriculture; people, commodity and service transport in rural America; economics of freight transportation in low density rural areas; and impacts on rural transportation from changes in the energy situation and transportation policies.

PB-274 759/0 PC A05/MF A01
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
Health and Safety Guide for Plywood and Veneer Mills
Jun 77, 82p Rept no. DHEW/PUB/NIOSH-77-186

Descriptors: *Industrial hygiene, *Woodworking, *Dust control, *Noise(Sound), Guidelines, Regulations, Hazardous materials, Protective clothing, Fire protection, First aid, Sanitation, Materials handling, Atmosphere contamination control, Safety engineering, Environmental engineering, Accident prevention, Storage, Records management. Identifiers: *Occupational safety and health, Air pollution control, Checklists, Protective equipment.

The report is intended to assist in providing for a safe and healthful work place in the plywood and veneer mills by describing safe practices and pointing out some of the more commonly violated safety and health standards. The main topics covered include: health and safety guidelines; frequently violated regulations; occupational health and environmental control; hazardous materials; personal protective equipment; fire protection; medical and first aid; sanitation; plant equipment; materials handling and storage; hand and portable power tools; welding, cutting and brazing; electrical code. (Color reproductions in black and white)

PB-275 182/4 PC A04/MF A01
San Diego State Univ., Calif. Center for Marine Studies.
Alternative Management Plans for Yellowfin Tuna in the Eastern Tropical Pacific
Special rept.
V. G. Flagg. 1977, 55 NOAA-77110314
Grant NOAA-04-3-158-22

Descriptors: *Tunas, *Economic development, *Fisheries, Management, Tropical regions, Regression analysis, Fishing, Licenses, Abundance, Recommendations, Leasing, Prices, Economic impact, Weight(Mass), Exploitation, Harvesting, Taxes, Cost analysis, South Pacific Ocean. Identifiers: Sea Grant program, *Overfishing, Quotas.

A simplified version of the economics of ocean fisheries is presented in general terms as it applies to the eastern tropical Pacific yellowfin tuna fishery. Recommendations for eliminating excess capacity and overfishing in the eastern Pacific are discussed and evaluated. Regression results on cost and revenue estimation in the fishery are given. These results were used to evaluate the impact of various management techniques on the industry.

PB-275 241/8 PC A09/MF A01
Dornbusch (David M.) and Co., Inc., San Francisco, Calif.
The Importance of Water Supply to Indian Economic Development
Completion rept.
James P. Merchant, and David M. Dornbusch. 1977, 184p OWRT-C-7042(6205)(1)
Contract DI-14-34-0001-6205

Descriptors: *Water supply, *Economic development, Economic analysis, Linear programming, Coal, Agriculture, Public land, Financing, Manpower, Economic impact, Water rights, North Dakota, South Dakota. Identifiers: *Indian reservations, Fort Berthold Reservation, Rosebud Sioux Reservation, Todd County(South Dakota).

The importance of water supply to economic development was analyzed for the Fort Berthold (North Dakota) and Rosebud Sioux (South Dakota)

SELECTED APPROPRIATE TECHNOLOGIES

Reservations. A linear programming model was developed for each Reservation's economy to determine the importance of water as a factor of production. Marginal productivity curves for water were constructed by varying the water supply assumed to be available to each Reservation. Both Reservations face substantial legal barriers to the full use of available water supplies. Should the Fort Berthold and Rosebud Sioux Reservations lose key legal contests, the resulting water shortage could limit the value added of their economies to 74 percent and 50 percent of their respective full potentials. Other factors which impede full development of Reservation resources include lack of financing, jurisdictional uncertainties, land ownership patterns, and a shortage of managerial and labor skills. The study offers guidelines for asserting water rights and for ameliorating some of the conditions inhibiting development.

PB-275 245/9 PC A04/MF A01
Woods Hole Oceanographic Institution, Mass.
Towards a Marine Policy In Latin America
Francisco J. Palacio. Oct 77, 63 WHOI-77-63,
NOAA-77110302
Grant NOAA-04-6-158-44106

Descriptors: *International relations, *Government policies, *Ocean environments, *Latin America, Resource management, Water resources, Conservation, Fisheries, Economic factors, Social effect, Appraisals, Mineral deposits, Developing countries, Mexico, Central America.
Identifiers: Sea Grant program, Law of the Sea, Global.

The need in Latin America for the adoption of comprehensive policies which consider the ocean as an integral and important part of the process of development is stressed. The ability to adopt and implement such policies is directly related to the marine scientific capability of the country and to national awareness of ocean affairs. The utilization and preservation of the oceans should be the result of national and regional ocean policies in Latin America. Thus, national ocean studies should be undertaken to identify areas of economic and social concern upon which such policies should be based. Developmental strategies in Latin America should include appraisals of marine ecosystems and the impact of development upon them; at a regional level the strategies should also consider the global role of the ocean in the biosphere.

PB-275 290/5 PC A04/MF A01
General Accounting Office, Washington, D.C.
Community and Economic Development Div.
National Water Quality Goals Cannot Be Attained Without More Attention to Pollution from Diffused or 'Nonpoint' Sources
Report to the Congress.
20 Dec 77, 55p* Rep no. CED-78-6

Descriptors: *National government, *Industries, *Municipalities, *Water pollution abatement, Sources, Grants, Sediments, Mine waters, Pesticides, Runoff, Agriculture, Forestry, Financing, Water pollution control, Expenses, Erosion control, State government, Local government, Project planning, Recommendations.
Identifiers: *Nonpoint sources, Mine acid drainage, Silviculture.

Water quality goals cannot be achieved in many rivers and lakes because of diffused, or 'nonpoint,' sources of water pollution. Limited controls exist and agencies developing comprehensive control plans under grants from the Environmental Protection Agency lack sufficient resources to gather needed data--a result of past and current emphasis on controlling industrial and municipal point sources of water pollution.

PB-275 345/7 PC A03/MF A01
Hawaii Agricultural Experiment Station, Honolulu.
An Alternative Prawn Production Systems Design In Hawaii
Technical rept.
Richard T. Gibson, and Jaw-Kai Wang. May 77, 38p UNIHI-SEAGRANT-TR-77-05, HAES-Journal Ser-2142, NOAA-77110420

Grant NOAA-04-6-158-44026, NOAA-04-6-158-44144
Report on Tropical Animal Aquaculture--Prawn Production and Management Systems Development.

Descriptors: *Fresh water, *Aquaculture, *Crustacea, *Hawaii, Economic development, Industries, Ponds, Reproduction(Biology), Design, Improvement, Savings, Cost analysis, Systems engineering.

Identifiers: *Macrobrachium rosenbergii, Sea Grant program.

Freshwater prawn farming is a new and dynamic growth industry in Hawaii. Considerable progress has been made in hatching and rearing techniques since they were first introduced in 1965, yet there is still considerable room for improvement, especially for the grow-out system. The current 'Avenue' strategy is broken down to functional components and examined in detail through use of engineering economy methods. Areas with short-term potential for improvement are identified and an alternative approach utilizing a narrow canal pond design is recommended. There are various advantages of this alternative which result in a cost savings of 14.8%. The basic short-term improvement recommended is a pond design that permits mechanization of costly operations such as feeding, harvesting, and pond maintenance and the development of sophisticated management strategies aimed at increasing yields.

PB-275 434/9 PC A03/MF A01
International Ferrocement Information Center, Bangkok (Thailand).

The Potentials of Ferrocement and Related Materials for Rural Indonesia; a Feasibility Study
Ricardo P. Pama, and Opas Phromratanaopongse. Oct 77, 28p

Sponsored in part by Agency for International Development, Djakarta (Indonesia). Prepared in cooperation with Siam Cement Co. Ltd., Bangkok (Thailand).

Descriptors: *Construction materials, *Indonesia, Developing countries, Pontoons, Water tanks, Storage tanks, Grains(Food), Well casings, Toilet facilities, Boats.

Identifiers: *Ferrocement, Appropriate technology.

This report summarizes the results of a short feasibility study conducted in Indonesia by a ferrocement team from the Asian Institute of Technology. Ferrocement has been identified as an appropriate technology material with many potential applications in developing countries especially in the rural areas. Field visits were made during the period October 4-18, 1977 in West Java, South Sulawesi and North Sumatra to obtain first hand information about the conditions of the rural people. The primary result of the survey is the identification of seven (7) potential applications of ferrocement and related materials; these are: pontoons, dugout canoes, water jars, toilet bowls, well casings, grain storage bins and building boards. The report recommends that extensive testing, field demonstration and evaluation be conducted to determine especially their social acceptability by the villagers before full-scale implementation is undertaken.

PB-275 569/2 PC A04/MF A01
Georgia Inst. of Tech., Atlanta. Economic Development Lab.

Pyrolytic Conversion of Agricultural and Forestry Wastes to Alternate Energy Sources in Indonesia; a Feasibility Study

John W. Tatom, Filino Harahap, Tze I. Chiang, R. Muchidin Apandi, and Harsono Wirjosumarto. Feb 77, 54p
Contract AID/ASIA-C-1203

Prepared in cooperation with Institute of Technology Bandung (Indonesia), Development Technology Center, and Padjadjaran Univ., Bandung (Indonesia).

Descriptors: *Agricultural wastes, *Wood wastes, *Pyrolysis, *Indonesia, Reclamation, Solid waste disposal, Fuels, Charcoal, Oils, Manufactured gas, Economic analysis, Design, Feasibility.

The study was conducted in Indonesia in a joint effort by personnel from the Engineering Experiment Station at the Georgia Institute of Technology and the Development Technology Center at the Institute of Technology Bandung. The principal circumstance that led to the study is the severe firewood cutting of the forests, especially in Java, which has resulted in damage to soil, water, and mangrove resources, with the resulting need for an alternate source of fuel for cooking. The study involved (1) an investigation of the production of agricultural and forestry wastes in Indonesia; (2) an evaluation of the market for the char, oil, and gas which are products of the pyrolytic conversion process; (3) the development of a preliminary pyrolytic conversion system design; and (4) an approximate economic evaluation of the system. The primary results of the waste survey indicate that at least 17 million tons of wastes are produced in Indonesia each year, with rice hulls comprising a third of the total and sawmill, coconut, logging, rubber, oil palm wastes and bagasse comprising the remainder. From the available wastes it is estimated that about 1.5 million tons of charcoal and .9 million tons of pyrolytic oils could be produced.

PB-275 811/8 PC A07/MF A01
National Demonstration Water Project, Washington, D.C.

Rural Community Action: Status and Recommendations
Final rept.

Stanley Zimmerman. Oct 77, 137p* OEO-LN-2147
Grant OEO-30141G-77-01

Descriptors: *Community development, *Rural areas, Projects, Services, Low income groups, Policies, Management, Housing studies, Medical services, Unemployment, Socioeconomic status.
Identifiers: *Community Action Programs, Poverty groups, *Antipoverty programs.

The report is an evaluation of the Community Action Program in rural America. The report describes the conditions and problems of the poor in rural areas: limited resources and mobility, lack of necessary job skills, poor housing stock and inadequate health care. In addition, the poor lack visibility and local officials are unwilling to rely on formal antipoverty programs. Successful rural community action programs are described and recommendations for future directions are given.

PB-276 055/1 PC A03/MF A01
Integrative Design Associates, Inc., Washington, D.C.

Appropriate Technology and Agriculture in the United States
A. Becker, and E. Eccli. 1977, 29p NSF/RA-770065
Grant NSF-ERS76-21350

Descriptors: *Policies, *Agriculture, Ecology, Recommendations, Environmental impacts, Citizen participation, Pest control, Income, Planning, Employment, Food processing, Constraints, Surveys, Marketing, Transportation, Food supply, Project planning, Urban areas, Research needs, Assessments, United States.
Identifiers: *Appropriate technology, Energy demand, Agribusiness, Organic farming.

The purpose of this report is to survey those in the United States currently active in the field of appropriate technology, describe their efforts, explore factors inhibiting the development and application of their innovations, report on their recommendations for Federal and National Science Foundation activities in support of appropriate technology, and assess the policy implications of appropriate technology. Two hundred and ninety-four individuals and groups from target populations concerned with issues related to the environment, local participation in planning and technology development, and unemployment/income stabilization responded to this survey. This paper is a compilation of the major ideas of approximately 40 individuals and groups who responded to the survey primarily because of their interests in the agricultural dimension of appropriate technology.

SELECTED APPROPRIATE TECHNOLOGIES

PB-276 129/4 . PC A04/MF A01
General Accounting Office, Washington, D.C. International Div.
U.S. Participation in International Agricultural Research
Report to the Congress.
27 Jan 78, 64p* Rept no. ID-77-55

Descriptors: *Agriculture, *Research projects, *Developing countries, International relations, Research management, Project planning, Universities, Organizations, Recommendations, Financing, Vegetables, Fertilizers, Pest control, Vertebrates, Birds, Rodents, Bats, Nutrition, Food, Technical assistance.
Identifiers: Priorities.

The importance of research to aid developing countries in meeting their food needs is being emphasized increasingly. Much attention has focused on the international agricultural research centers as a result of the development of high-yield varieties of rice and wheat which created the hope of a 'Green Revolution.' This report examines the Agency's support of international agricultural research centers and its research strategy and makes recommendations for improving management of the program.

PB-276 507/1 PC A05/MF A01
Instituto de Capitacion, Guatemala City. Dept. Técnico Didáctico.
Manual Talia de Madera (Wood Carving Manual)
1945, 97p Rept no. MD-41
Text in Spanish.

Descriptors: *Woodworking, Manuals, Wood products, Spanish language, Instructional materials, Tools.

The report contains instructions in Spanish in carving and finishing objects of wood.

PB-276 746/5 PC A03/MF A01
Economic Development Administration, Washington, D.C. Program Analysis Div.
Source Bibliography Employee Stock Ownership Plans (ESOP)
Oct 77, 37p* Rept no. EDA-78-032

Descriptors: *Employees, *Investments, *Capital, *Bibliographies, Corporations, Industries, Incentives, Motivation, Savings, Benefits, Legislation.
Identifiers: *Employee stock ownership, *ESOP (Employee Stock Ownership Plans), Employee stock ownership plans.

The bibliography was compiled with the assistance of three useful research tools: the SCORPIO data bank maintained by the Library of Congress; the New York Times data bank; and an ESOP bibliography prepared by the Congressional Research Service. Employee Ownership Plans have been viewed as a means of improving employee motivation and productivity, diversifying the ownership of capital, providing alternatives to conventional compensation and benefit plans, and saving jobs. An Employee Stock Ownership Plan is an employee benefit program through which employees can acquire part or all of the stock in the corporation for which they work. Since the ESOP Act of 1973, four additional pieces of legislation have been adopted relating to the use of the employee stock ownership concept.

PB-276 908/1 PC A08/MF A01
Arizona Univ., Tucson. Office of Arid Lands Studies.
The Impact of Groundwater Development in Arid Lands: A Literature Review and Annotated Bibliography
Information paper
Susan Jo Keith. 1977, 153p* ARID LANDS RESOURCE-IP-10, OWRT-W-197(5254)(2)
Contract DI-14-31-0001-5254

Descriptors: *Ground water, *Water pollution, *Arid land, *Water supply, *Bibliographies, Environmental impacts, Social effect, Economic impact, Economic development, Subsidence, Developing countries, Stream flow, Agriculture, Irrigation, Reviews, Aquifers, American Indians, Arizona, Pakistan.
Identifiers: *Water management (Applied).

As groundwater comes increasingly under development, it is imperative, for economic, ecological, and political reasons, to anticipate the impact of its development. The literature is reviewed on this impact in arid lands in terms of two general categories: physical environment impacts and socioeconomic impacts. Two case studies are presented: One focuses on the impact of groundwater development on the Papago Indians; the second, through a discussion of groundwater development in Pakistan, demonstrates the role groundwater development can play in the economic development process in developing arid countries.

PB-276 946/1 PC A04/MF A01
Michigan Univ., Ann Arbor. Inst. for Social Research.
Employee Ownership. Employee Stock Ownership Plan (ESOP), Survey Research Center, Institute for Social Research, University of Michigan
1978, 70p* EDA-78-029
Grant EDA-99-6-09433

Descriptors: *Economic development, *Technical assistance, Capital, Assets, Purchasing, Employees, Benefits, Profits, Investments, Economic evaluation, Industries, Corporations, Statistical analysis.
Identifiers: *ESOP (Employee Stock Ownership Plan), *Employee stock ownership plan, *Employee stock ownership.

The study is about one of the most recent variations to emerge in the Employee Stock Ownership Plan, or ESOP, which permits employees to acquire up to 100 percent of the equity of the firm for which they work. This plan not only affords a real increase in property ownership for the workers as individuals, but also serves as an instrument for new corporate capital formation. Data have been collected on 98 firms, including such information as industry type, number of employees, magnitude of sales volume, the percent of employees who participate in the ownership plan. In thirty of the companies we were able to obtain actual data about profit and we therefore analyzed for this sub set of companies the relationship between profit and some of the aspects of ownership.

PB-276 959/4 PC A09/MF A01
Denver Research Inst., Colo.
Report on the Workshop, New U.S. Initiatives in International Science and Technology, Held at Keystone Colorado, April 13-16, 1977
Aug 77, 195p*
Grant NSF-INT76-1499

Descriptors: *Technology transfer, *Meetings, Developing countries, Foreign aid, International relations, Leadership, Scientists, Cooperation, Recommendations.
Identifiers: Appropriate technology.

The Denver Research Institute conducted on April 13-16, 1977, a workshop on new U.S. initiatives...under the sponsorship of NSF. Fifty members of the U.S. science and technology community met to examine present U.S. international S&T goals, policies and mechanisms, and to recommend future directions. The workshop addressed these issues within the context of working groups divided into developed, developing and underdeveloped nations and international organizations. A number of recommendations for change in U.S. policy, planning, program activities are presented in this report.

PB-277 485/9 PC A04/MF A01
Arizona Water Resources Research Center, Tucson.
Urban Flood Water Management Systems in Semi-Arid Regions: Model Extension, Design and Application
Completion rept. 1 Jul 73-30 Jun 74
K. Arai, S. Ince, and S. D. Resnick. 1977, 71p
OWRT-A-049-ARIZ(1)
Contract DI-14-31-0001-4003

Descriptors: *Thunderstorms, *Runoff, *Drainage, *Urban areas, Watersheds, Computer programs, Fluid infiltration, Rainfall intensity, Mathematical models, Water flow, Variance (Statistics), Arizona. Identifiers: *Storm water runoff, Tucson (Arizona), Hydrographs, *Urban hydrology.

A non-linear reservoir model is used to represent the rainfall-runoff relationships for thunderstorms on the urban watersheds of Tucson, Arizona. Two types of computer programs are developed: a calibration program to obtain a best-fit calculated hydrograph; and a verification program to generate storm hydrographs given the watershed characteristics and a hyetograph. Calibration reveals the relationship of the model parameters, namely, (f) the inflow coefficient, (a) the constant coefficient, and (TL) the time lag, to the total rainfall, drainage area, channel length, and infiltration capacity of the watershed. The average discrepancy between the predicted hydrograph and the actual hydrograph for Tucson urban watersheds is 20-25 percent. (Portions of this document are not fully legible)

PB-277 726/6 PC A03/MF A01
Transport and Road Research Lab., Crowthorne (England).
Forecasting Rural Road Travel in Developing Countries from Studies of Land Use
J. D. G. F. Howe, and B. S. Tennant. 1977, 38p
Rept no. TRRL-SUPPLEMENTARY-754

Descriptors: *Developing countries, *Rural areas, *Travel, Forecasting, Roads, Surveys, Land use, Interviews, Kenya, Vehicular traffic, Planning, Great Britain.
Identifiers: Vehicle ownership.

In many developing countries, the difficulty of standardizing trip measurements, the flexibility with which vehicles are used and the absence of a conventional sampling frame for interviewing road users are the main obstacles to forecasting travel from land use. A study in Kenya has shown the difficulties of using roadside interviews for establishing trip relationships, but has indicated that a suitable sampling frame could be constructed by a direct survey of vehicle owners. The vehicle owner in the broadest sense would then become the fundamental unit for trip studies. The Report suggests that home and workplace questionnaire surveys, focussing on the vehicle owner, may be suitable for the extensive sampling necessary to evolve standards for studies of rural trip characteristics. Definitions of employment suitable for land-use/transport studies in developing countries are suggested in the Report. These covered only 4 percent of the population of the study area, but nevertheless, statistically they provided the best explanation both for vehicle ownership and for trip generation. Trip origins from Agricultural and Residential land uses did not reach significant proportions. The main generators were Retail and Commercial, Road Transport, and Government Administration land uses, which together accounted for over 75 percent of urban trip origins and 57 percent of all trip origins. (Copyright (c) Crown Copyright 1977.)

PB-278 033/6 PC A07/MF A01
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
Health and Safety Guide for Sawmills and Planing Mills
Jul 77, 132p* Rept no. NIOSH-78-102

Descriptors: *Safety engineering, *Sawmills, *Milling machines, *Guidelines, Machine tools, Planing, Woodworking, Workplace layout, Requirements, Standards, Industrial hygiene, Safety devices, Ventilation, Hazardous materials, Personnel development, Accident prevention, Human factors engineering, Protective equipment, Fire safety.
Identifiers: Occupational safety and health.

The guide assists in providing a safe and healthful workplace for sawmills and planing mills. It describes safe practices and helps correct some of the more frequently encountered violations of the safety and health standards. The main topics covered include: the hazards most commonly encountered in saw mills; health and safety guidelines and programs; tools and equipment; walking and working surfaces; standard guard rails; exits and exit

SELECTED APPROPRIATE TECHNOLOGIES

markings; occupational health and environmental control; ventilation; noise exposure; hazardous materials, spray painting; personal protective equipment; respiratory protection; sanitation; medical and first-aid; fire protection; compressed air equipment; powered industrial trucks; hoisting equipment; machinery and machine guarding; electrical code.

PB-278 351/2 PC A05/MF A01
 Florida Univ., Gainesville. Inst. of Food and Agricultural Sciences.
Sugarcane Production Residues: Technologic and Economic Assessment of Methods for Conversion to Utilizable Energy Forms
 Final rept.
 R. A. Nordstedt, P. H. Smith, L. O. Bagnall, and F. LeGrand. Mar 78, 82p DOE/USDA-19464/76/FR-2
 Contract USDA-12-14-1001-604

Descriptors: *Energy conversion, *Bagasse, Solid waste disposal, Residues, Feasibility, Technology, Economics, Anaerobic processes, Pyrolysis, Incineration, Process charting, Design criteria, Performance evaluation, Sugarcane, Solid wastes.
Identifiers: *Refuse derived fuels.

This report examines the technologic and economic feasibility of converting sugarcane production residues in South Florida to utilizable energy forms. Quantity and location of the residues are given. Current uses of the residues are outlined and compared with other potential uses which are described in the literature. Technological problems in collection of the field residues are discussed. The resulting research and development needs are outlined. An in-depth economic comparison of anaerobic digestion, shaft pyrolysis, and waterwall incineration is presented. Economic feasibility of each of the three processes is presented as a function of plant size using current market prices for energy and the energy price increases which would be necessary to make each of the processes economically feasible.

PB-278 882/6 PC A03/MF A01
 Economics, Statistics, and Cooperatives Service, Washington, D.C. National Economic Analysis Div.
Farmer-to-Consumer Marketing
 Final rept.

H. R. Linstrom. Feb 78, 31p Rept no. ESCS-01

Descriptors: *Agricultural products, *Marketing, Vegetables, Fruits, Profits, Consumer affairs, Benefits, Quality, Legislation.
Identifiers: *Direct marketing, Farmer to consumer Direct Marketing Act 1976, Farmers markets.

Estimates indicate there were over 13,000 farmer-to-consumer direct-marketing outlets in the United States in 1976. Farmers view this as an alternative market outlet to increase their income. Consumers see it as a means of getting fresher, higher quality foods at less cost. Consumers also see social and cultural benefits from direct contacts with farmers, visits to farms, and a so-called return to nature. Passage of the Farmer-to-Consumer Direct Marketing Act of 1976 reflects national interest in direct marketing of farm products, and there is strong evidence of increased attention at the state level.

PB-278 986/5 PC A03/MF A01
 National Rural Water Association, Washington, D.C.
Rural Water and Sewer Systems Problems, Needs, Issues, Opportunities, and Goals: A Report on the Proceedings of the National Organizational Conference of the National Rural Water Association (1st) Held in Oklahoma City, Oklahoma on April 15-16, 1976
 Aug 76, 47p EDA-78-065

Descriptors: *Sewers, *Sewage treatment, *Water supply, *Meetings, Objectives, Rural areas, Population growth, Financing, Public health, Specialized training, Management, Design, Maintenance, State government, Legislation, Local government, National government.

The purpose of this report is to describe and define briefly the principal problems, issues, opportunities and goals which have a significant impact upon the stability and growth of rural water and sewer system throughout this country. The source for this material is the series of conference sessions held by representatives of eight State Rural Water Associations at the organizational meeting in Oklahoma City. The proceedings were heavily oriented toward water supply systems.

PB-278 999/8 PC A03/MF A01
 Economics, Statistics, and Cooperatives Service, Washington, D.C. National Economic Analysis Div.
An Assessment of Anaerobic Digestion In U.S. Agriculture
 Final rept.

Don Thornton. Mar 78, 45p* Rept no. ESCS-06

Descriptors: *Digestion(Decomposition), *Anaerobic processes, *Methane, *Agriculture, Anaerobic bacteria, Agricultural wastes, Cattle, Fertilizers, Economic analysis, Feeding stuffs, Design, Fuels, Digesters, Sludge, Cost analysis, Feasibility, Production, Assessments.
Identifiers: Manure.

Anaerobic digestion is a biological process in which bacteria break down organic matter to produce methane, partially stabilized effluent, and other products. Although the process has been advocated as a source of fuel, feed, and fertilizer, its widespread adoption in American agriculture is doubtful. The cost and complexity of most digestive systems make them difficult to incorporate in agricultural operations. Although site specific applications may be feasible, these will not have a major impact on the agricultural sector. As a source of energy, there is little possibility of anaerobic digestion providing even a small percentage of national energy requirements.

PB-279 095/4 PC A07/MF A01
 Economics, Statistics, and Cooperatives Service, Washington, D.C. Commodity Economics Div.
Estimating U.S. Livestock and Poultry Manure and Nutrient Production

Final rept.
 Donald L. Van Dyne, and Conrad B. Gilbertson. Mar 78, 150p* Rept no. ESCS-12

Descriptors: *Livestock, *Poultry, *Agricultural wastes, Estimates, Animal products, Fertilizers, Materials handling, Production, Losses, Nitrogen, Phosphorus, Potassium, Recovery, Tables(Data), States(United States), Volume, Weight(Mass), Storage.
Identifiers: *Manure.

Estimates are developed for total manure, nitrogen, phosphorus, and potassium produced by and available from livestock and poultry in the United States in 1974. Also included are estimates of the amount retained after losses from storage and waste handling systems, and estimates of the amounts which could be economically recovered for use elsewhere. A ratio of total manure production to acres of cropland and pastureland is developed to provide an indication of animal manure concentration on a county-to-county basis in the United States.

PB-279 193/7 PC A08/MF A01
 Arizona Univ., Tucson. Dept. of Systems and Industrial Engineering.
Appropriate Technology for Natural Resources Development: An Overview, Annotated Bibliography, and a Guide to Sources of Information

Robert L. Bulfin, and Harry L. Weaver. 1977, 174p
 Grant AID/ta-G-1111
 Report on Arid/Semi-Arid Natural Resources Program.

Descriptors: *Technology, *Economic development, *Bibliographies, Developing countries, Organizations, History, Industries, Agriculture, Water supply, Irrigation, Indexes(Documentation), Data sources.
Identifiers: Appropriate technology, *Information sources, *Intermediate technology.

The purpose of this paper is to acquaint the interested reader with the subject matter commonly referred to as Intermediate Technology (IT). The paper is an attempt to capture the essence of the subject by providing an overview, with the bibliography used to obtain additional details. For those who wish to pursue the subject beyond the citations presented in the bibliography, Appendix A, a guide to the sources of information (i.e. indices, journals, and practicing organizations) on Appropriate and/or Intermediate Technology, is included. A brief history of the development of IT is given, followed by its thematic framework. Examples of IT in developing countries are then presented to familiarize the reader with the breadth of applications. The question, Is Intermediate Appropriate, is also discussed.

PB-279 211/7 PC A20/MF A01
 International Research and Technology Corp., McLean, Va.
An Assessment of Controlled Environmental Agriculture Technology
 Final rept.
 Lawrence H. de Bivort, Theodore B. Taylor, and Miguel Fontes. 17 Feb 78, 476p IRT-469-R, NSR/RA-780024
 Contract NSF-C1026

Descriptors: *Farm crops, *Vegetables, *Agricultural economics, Assessments, Economic impact, Environmental impacts, Agronomy, Cost analysis, Water conservation, Shortages, Farms, Production, Food storage, Solar energy, Greenhouses, Operating costs, Soil conservation, Employment, Transportation.
Identifiers: *Controlled environment agriculture.

Assessment of the economic, environmental, social, and other impacts of large scale use of technology for growing food inside enclosures, Controlled Environment Agriculture (CEA), was initiated to alleviate the agro-food problems of environmental degradation; shortages of arable land, water, and fertilizers; and unreliable production. Primary conclusions were: (1) Large scale use could alleviate these problems; (2) costs of present systems are too high for agronomic crops, but acceptable for some high value fresh vegetables; (3) new systems can be made at lower costs and less total energy consumption; (4) there is a need to link R&D to open field agriculture, solar energy systems, water management, and low-cost structures; and (5) CEA should be used with solar energy and water management systems for large communities. The study includes a conceptual analysis of future systems, cost evaluations, and a diffusion analysis of non-economic considerations.

PB-279 379/2 MF A01
 National Research Council, Washington, D.C. Board on Agriculture and Renewable Resources.
World Food and Nutrition Study: Enhancement of Food Production for the United States
 Nov 75, 186p Rept no. ISBN-0-309-02435-8
 Library of Congress Catalog Card no. 75-37121. Paper copy available from National Academy of Sciences, 2101 Constitution Ave, N.W., Washington D.C. 20418.

Descriptors: *Agriculture, *Nutrition, *Food supply, Research projects, Financing, Production, Nitrogen fixation, Plant genetics, Recommendations, Pest control, Developing countries, Research management, Animal diseases, Livestock, National government, Public law, Food composition, Diets, Food consumption, United States.
Identifiers: Priorities.

This report focuses on the biological, chemical, and physical research priorities for enhancing the production and improving the dependability of U.S. food supplies. The report points to some deficiencies in our current investment in agricultural and food research and recommends significant increases in funding for innovative and crucial research programs. Changes are also suggested in the administrative procedures and resource management practices of the Federal and state agencies concerned with agricultural, food, and nutrition research.

SELECTED APPROPRIATE TECHNOLOGIES

PB-279 440/2 PC A08/MF A01
Material Systems Corp., Escondido, Calif.
A Study of the Feasibility of Utilizing Solid Wastes for Building Materials. Phase I Summary Report
B. L. Duff, H. Levine, and A. McLeod. Apr 78, 164p* EPA/600/2-78/091
Contract EPA-68-03-2056

Descriptors: *Construction materials, *Solid waste disposal, *Industrial wastes, *Reclamation, Reinforced plastics, Management planning, Composite materials, Reinforcing materials, Fillers, Fly ash, Glass, Agricultural wastes, Cellulose, Fibers, Phenolic resins, Bagasse, Cements, Starches, Lignin, Wood wastes, Sludge disposal, Laboratory tests, Performance evaluation, Furfurals.
Identifiers: Manure, Rice hulls, Plastic recycling, Glass recycling, Sewage sludge, Waste recycling.

This document reports on a study to research and develop building materials containing organic and inorganic wastes and waste-derived products. A comprehensive literature search was conducted to review and evaluate wastes with potential as matrices, reinforcements, or fillers in building composites. The most promising candidates were evaluated with limited laboratory studies. From these studies, two types of matrices, furfural-phenolic and inorganic, were selected for further study. Seven reinforcement candidates and five filler candidates were selected for evaluation with the two matrices.

PB-279 517/7 PC A08/MF A01
Economic Research Service, Washington, D.C.
Foreign Development Div.
Controlled Environment Agriculture: A Global Review of Greenhouse Food Production
Foreign agricultural economic rept. (Final)
Dana G. Dalrymple. Oct 73, 164p Rept no. FAER-89

Descriptors: *Horticulture, *Greenhouses, *Agricultural economics, *Developing countries, Food, Production, Lettuce, Tomatoes, Vegetables, Heating, Cooling, Carbon dioxide, Soils, Irrigation, Fertilizers, Capital, Polymeric film, Fixed investments, Manpower, Operating costs.
Identifiers: Global.

Controlled environment crop production is most nearly approached, on a commercial scale, in greenhouses. Greenhouses have been used for food production for over a century, mainly in developed regions. The introduction of plastic film during the 1950's lowered construction costs and made it possible for less affluent nations to use greenhouses. Among the newer techniques of environmental control used commercially are artificial cooling, carbon dioxide enrichment, use of artificial soil, and automated irrigation with liquid fertilizers. Greenhouse labor and capital requirements per unit of land exceed those for outdoor food crop production. Much of the work must be done by hand; there are usually few economies of scale beyond family-sized operations. Capital investments for glasshouses in developed nations commonly exceed \$100,000 per acre. The most important crops produced worldwide are tomatoes, cucumbers, and lettuce. On a global basis, environmental control via greenhouses will be increasingly important in agriculture.

PB-279 756/1 PC A06/MF A01
Economic Research Service, Washington, D.C.
Foreign Demand and Competition Div.
The World Food Situation and Prospects to 1985
Foreign agricultural economic rept. (Final 1974-85).
Dec 74, 104p* Rept nos. FAER-98, AGERSF-16

Descriptors: *Food supply, Production, Food consumption, Prices, Commerce, Grains(Food), Reserves, Inventories, Stock pile management, Prices, Policies, Developing countries, Agricultural economics, Nutrition, Nutritional deficiency diseases.
Identifiers: United Nations, Food aid programs, Food technology, *World food.

Patterns of world food production, consumption, prices, and trade in the two decades prior to 1972 are analyzed in terms of their effect on the turbulent world food situation of 1972-74. Also examined are several issues that will shape developments in the next decade, including grain reserve levels, nutritional requirements, food aid, resource availability for producing food, weather, and demand for food. Projections to 1985 of world food supply and demand are included, and differences among developing countries are outlined. The analysis concludes that factors giving rise to the present world food situation are largely transitory and can be corrected. Food supplies will remain tight and their prices high for the next year or two, but in the longer term and for the world as a whole, more food can be produced per person and food production can be generally adequate to meet demand. But, substantial malnutrition will probably persist among low-income groups in the less prosperous developing countries, and special national and international programs will be necessary to help those most seriously threatened.

PB-279 771/0 PC A02
North Carolina State Univ., Raleigh. Sea Grant Coll. Program.
The \$6-Million Eel, or from Balt to Delicacy In Four Years
Karen M. Jurgensen, and Gene Crow. 1977, 8p UNC-SGR-115, NOAA-78032008

Descriptors: *Eels, *Aquaculture, Economic development, Harvesting, Prices, Demand(Economics), North Carolina.
Identifiers: Sea Grant program.

In five years, the University of North Carolina Sea Grant College Program has spent less than \$75,000 on wild eel harvesting advisory services. What started out as an effort to tap an underutilized species has led to an increasingly sophisticated and expanding industry—one which promises even further development. There is a potential market now for eels of all sizes. Extensive worldwide demand continues, prices are good, supplies are down elsewhere. To have created a market would have taken a lot longer if, indeed, it could have done at all. The project has lived up to its goals. It has improved the financial situation of at least 350 fishermen and a number of businesses. It promises to do more.

PB-279 775/1 PC A07/MF A01
Nebraska Univ., Lincoln. Water Resources Center.
Water Problems in the Rural Environment; Alternative Solutions for Water Supply and Wastewater Disposal. Proceedings of a Conference Held at Lincoln, Nebraska on November 4-5, 1976
1978, 142p

Descriptors: *Sewage disposal, *Water supply, *Rural areas, *Meetings, Monitoring, Water quality, Water law, Policies, Social effect, Financing, Water wells, Water distribution.

The purpose of this conference was to describe the current rural water situation. Rural water supply and wastewater disposal problems, including both quality and quantity, were considered. The socio-economic and technological aspects of alternative solutions to rural water problems and the various impacts involved in changing or improving the current situation were examined. Future research and related needs to solve various rural water problems were outlined. The conference focused on domestic and farmstead use of water and included considerations of supply systems ranging from that required for an individual home to that required for a small community.

PB-280 053/0 PC A08/MF A01
Economics, Statistics, and Cooperatives Service, Washington, D.C. Foreign Demand and Competition Div.
Alternative Futures for World Food In 1985. Volume I. World GOL (Grain-Oilseeds-Livestock) Model Analytical Report
Final rept.

A. Rojko, D. Regier, P. O'Brien, A. Coffing, and L. Bailey. Apr 78, 153p* Rept nos. AGERSF-22, FAER-146

Descriptors: *Food supply, *Agricultural economics, Mathematical models, Economic models, Agricultural products, Grains(Food), Oilseed crops, Livestock, Predictions, Commerce, Developing countries, Production, Exports, Demand(Economics).

Identifiers: *World food, *GOL model.

The volume reports on analysis and general results of the world grain-oilseeds-livestock (GOL) model. The results point up the importance of the strong interrelationships tying together the world commodity sectors. Projections rest on a number of alternative sets of assumptions about world economic growth, trade, and food policy conditions. However, the projections indicate that regional food distribution problems are likely to persist. Moreover, the alternative which assumes lower grain yields and deteriorating climate and weather suggests the possibility of serious pressures on resources and increases in price of grain imported by the developing countries. As a whole, the developing countries' grain imports are projected to increase faster than imports in the rest of the world. Imports in 1985 are projected to range from 49 million tons under the alternative which assumes a continuation of present agricultural and trade policies, to 91 million tons under the high import demand alternative; both compare with recent levels of 30-35 million tons. Rising demand for meat and livestock products is projected under all alternatives. Growth in the commercial sectors of the world meat economy ranges from one-third to one-half above 1970 base levels.

PB-280 100/9 PC A05/MF A01
Puerto Rico Univ., Mayaguez. Water Resources Research Inst.
Puerto Rico's Water Resources Problems and Research Needs. Proceedings of Conference and Planning Session (1st) Held at the University Library of the Mayaguez Campus on February 14, 1974
Roberto Vazquez. 14 Feb 74, 95p OWRT-A-999-PR(2)
Prepared in cooperation with Puerto Rico Dept. of Natural Resources, San Juan.

Descriptors: *Water resources, *Puerto Rico, *Meetings, Agriculture, Water supply, Industrial water, Sugar crops, Water conservation, Research projects, Water pollution, Water storage, Flood control, Economic development, Virgin Islands.
Identifiers: Water demand, Research needs.

The proceedings of a conference and planning session to identify Puerto Rico's water resources problems and research needs are presented. Panel discussions were conducted on water for agriculture, water for development, water for industry, and on water and environmental quality R and D efforts. The agricultural discussion centered on water resource needs for sugar production and on Federal soil and water conservation programs. Economics, flood control, domestic water use problems and research needs, and Corps of Engineers water resources programs were discussed with regard to development. The panel on water and environmental quality discussed water quality problems and research needs, EPA water resources programs, USGS water resources research, and water resources in the Virgin Islands. (Portions of this document are not fully legible)

PB-280 125/6 PC A03/MF A01
Missouri Univ.-Columbia.
Elimination of Pollutants by Utilization of Egg Breaking Plant Shell-Waste
Final rept.
J. M. Vandepopuliere, H. V. Walton, W. Jaynes, and O. J. Cotterill. Mar 78, 47p EPA/600/2-78/044
Grant EPA-S-803614

Descriptors: *Solid waste disposal, *Water pollution control, Industrial wastes, Feeding stuffs, Eggs, Dehydrators, Design criteria, Milling, Cost analysis, Operating costs, Chemical oxygen

SELECTED APPROPRIATE TECHNOLOGIES

demand, Chemical composition, Performance evaluation, Microorganisms, Moisture content. Identifiers: *Land disposal, *Egg breaking plants, Egg industry, Biochemical oxygen demand.

Egg breaking plants yield an estimated 50,000 tons of waste annually. These wastes are commonly disposed of on land. This method of disposal is becoming more difficult due to the potential for pollution of local water resources. A triple pass rotary drum dehydrator was installed at an egg breaking plant. With appropriate engineering modifications a system for producing egg shell meal from the total egg shell waste from the breaking plant was developed. This meal was utilized as a feedstuff by a local mill and incorporated into a layer diet. This diet was fed to several commercial flocks of cage layers. Appropriate data were collected to determine meal production costs, yield of meal, feed produced, feeding data, and layer flock performance. COD and BOD data were generated to determine the pollution potential of the waste were it not converted to a useful by-product.

PB-280 161/1 **PC A08/MF A01**
 Philippine Council for Agriculture and Resources Research, College.
International Consultation on Ipil-ipil Research
 Jan 78, 164p
 Sponsored in part by Agency for International Development, Washington, D.C.

Descriptors: *Trees(Plants), *Arid land, *Developing countries, *Meetings, Tropical regions, Plant genetics, Forage crops, Production, Cultivation, Soil properties, Feeding stuffs, Utilization, Wood, Reforestation, Charcoal.
 Identifiers: *Leucaena leucocephala.

Discoveries on the multi-uses of ipil-ipil (*Leucaena* spp.) generated worldwide interest in the production of this versatile plant. Originating from Mexico, this species was introduced to various tropical countries especially in Southeast Asia. Undoubtedly, research on ipil-ipil production and its utilization could vary from one country to another and this could influence the formulation and priority listing of research problems areas. Participants from the United States, Mexico, Australia and Taiwan merged their expertise, experiences and ideas with Filipino scientists in an effort to: (1) put together all available information of ipil-ipil; (2) identify international potentials of the plant for forage, wood and reforestation purposes; and (3) formulate priority research areas and action to fully realize the potentials of the plant. The main objective of the publication of the proceedings of this important conference is to provide a reference for scientists and development workers in countries where ipil-ipil is or could be grown.

PB-280 196/7 **PC A03/MF A01**
 Economics, Statistics, and Cooperatives Service, Washington, D.C. Commodity Economics Div.
The Performance and Economic Feasibility of Solar Grain Drying Systems
 Final rept. for 1976
 Walter G. Heid, Jr. Feb 78, 39p* Rept no. AER-396

Descriptors: *Solar dryers, *Crop driers, Solar drying, Drying apparatus, Farm crops, Grain crops, Agricultural engineering, Solar collectors, Cost analysis, Performance evaluation, Agricultural economics, Performance tests.

The performance and costs of eight experimental on-farm solar collectors designed to dry corn were studied. Solar drying costs were compared with the costs of owning and operating conventional grain dryers. The eight solar grain drying systems studied include: Rock heat-storage, flat-plate, inflated tube, suspended plate, wraparound, intensifier, air-supported, and multiuse.

PB-280 317/9 **PC A05/MF A01**
 General Accounting Office, Washington, D.C. Community and Economic Development Div.
Redesigning Shipping Containers to Reduce Food Costs
 Report to the Congress.
 28 Apr 78, 89p* Rept no. CED-78-81

Descriptors: *Food packaging, *Containerizing, *Shipping containers, Cost engineering, Packaging, Metric system, Containers, Modular structures, Unitizing, Design, National government.
 Identifiers: Department of Agriculture.

The Federal Government spent an estimated \$10.3 billion for food in fiscal year 1977. This amount can be reduced by using modularization -- a system geometrically relating the size of food shipping containers to one another. Benefits include reduced damage, increased productivity, and possibly lower prices to the consumer. Benefits from this system have been realized in European countries, but little is being done within the United States. To encourage Government-industry awareness of this efficiency opportunity, GAO recommends that: (1) The Department of Agriculture take the initiative in advancing the understanding of modularization; (2) The U.S. Metric Board consider modularization in any metrication actions to change package sizes in the food industry; (3) The Congress include testimony on modularization efforts in any consideration of food marketing and prices.

PB-280 359/1 **PC A06/MF A01**
 Foreign Economic Development Service, Washington, D.C.
Survey of Multiple Cropping In Less Developed Nations

Interim rept.
 Dana G. Dalrymple. Oct 71, 120p Rept nos. FEDR-12, AGERSF-25

Prepared in cooperation with Agency for International Development, Washington, D.C.

Descriptors: *Agricultural economics, *Agriculture, *Developing countries, History, Cultivation, Yield, Climate, Soils, Fertilizers, Pesticides, Irrigation, Water supply, Rotation, Social effect, Economic development.

Identifiers: Multiple cropping.

Multiple cropping is the practice of growing more than one harvested crop in sequence on the same piece of land in the course of one year. While an ancient technique, multiple cropping is of current importance because of the promise it holds for alleviating important problems in the less developed nations. Technological advances in developing short-season varieties have (1) broadened the area where multiple cropping is possible, and (2) increased the potential number of crops which may be grown in current multiple cropping areas. But to take advantage of multiple cropping, adequate water control must be available, along with farm chemicals in improved farm management. The report surveys the development in current status of multiple cropping in less developed nations.

PB-280 662/8 **PC A05/MF A01**
 Agricultural Research Service, Beltsville, Md. Biological Waste Management and Soil Nitrogen Lab.
Sewage Sludge Entrenchment System for Use by Small Municipalities

Interim rept. for Jun 74-Jun 75

J. M. Walker, L. Ely, P. Hundemann, N. Frankos, and A. Kaminski. Feb 78, 83p* EPA/600/2-78/018

Descriptors: *Land reclamation, *Sludge disposal, *Municipalities, Ditches, Soil properties, Drainage, Earth handling equipment, Cost estimates, Manpower, Calcium oxides, Odors, Surface water runoff, Monitoring, Viruses, Metals, Nitrogen, Feasibility.
 Identifiers: Trenching.

A method of disposing of dewatered sewage sludge by entrenching it into soil was developed for small communities. Readily available and relatively inexpensive equipment was used. Included were a tractor equipped with a loader and backhoe, and dump truck or concrete mixer truck. A tractor operator and a truck driver were required. Trenches, dug with the backhoe, were 60 cm wide, 60 cm deep, and 60 cm apart. The time required to entrench 12 tons of dewatered sludge was one hour. The estimated cost of sludge incorporation was less than \$15.00 per ton of dewatered sludge. Cost items included equipment, personnel, hauling

(64 km round trip), land, drainage monitoring, and cultivation. Reuse of a previously trenched site indicated that about 2 years is the minimum satisfactory time lapse between the first and second entrenchment. Trenching of limed sludge cake can be done without odor or surface water runoff problems. Trenching is most appropriate on low quality land where surface application is not feasible.

PB-281 073/7 **PC A08/MF A01**
 Hawaii Biomass Energy Study Team.
Biomass Energy for Hawaii. Volume II. Sugar Operations
 Final rept.
 Feb 77, 162p Rept no. HB-2
 Also available in set of 4 reports PC E14, PB-281 071-SET.

Descriptors: *Biomass, *Hawaii, *Sugars, Sources, Sugar alcohols, Process charting, Design criteria, Sugarcane, Materials recovery, Economic analysis, Electric power generation, Ethanol, Pilot plants, Harvesting, Byproducts, Bagasse.
 Identifiers: *Energy sources, Biological energy conversion.

This volume considers sugar operations as it relates to energy sources. It covers harvesting operations, mill operations, electrical rate structures, alcohol production and general evaluation framework.

PB-282 062/9 **PC A04/MF A01**
 National Bureau of Standards, Washington, D.C. Center for Building Technology.
Methods for Characterizing Adobe Building Materials
 Final rept.
 James R. Clifton, Paul W. Brown, and Carl R. Robbins. Jun 78, 63p Rept no. NBS-TN-977
 Sponsored in part by National Park Service, Washington, D.C.

Descriptors: *Construction materials, *Residential buildings, *Cohesive soils, Physical properties, Mineralogy, Particle size, pH, Durability, Standards, Plastic properties, Chemical composition, Microscopy, X ray diffraction, Color, Inorganic salts, Electron microscopy.
 Identifiers: *Adobe soils.

Methods are described for the characterization of those physical properties and mineralogical features of adobe which appear to have the most significant affect on the durabilities of adobes. These methods include determinations of color, pH, soluble salts, particle size distribution, liquid and plastic limits, and the X-ray 'fingerprint' of adobe. In addition, methods are given for the identification of the mineralogy of adobe soils and for the examination of the microfabric of adobe.

PB-282 228/6 **PC A12/MF A01**
 Economics, Statistics, and Cooperatives Service, Washington, D.C. Foreign Demand and Competition Div.
Alternative Futures for World Food in 1985: Volume 2. World GOL Model Supply-Distribution and Related Tables
 Final rept. 1970-85

Anthony Rojko, Patrick O'Brien, Donald Regier, Arthur Coffing, and Linda Bailey. May 78, 254p* Rept no. FAER-149

Descriptors: *Food supply, Mathematical models, Grains(Food), Oilseeds, Livestock, Economic analysis, Distribution systems, Forecasting, Regions, Countries, Prices, Production, Food consumption, International trade, Imports, Developing countries, Meat, Tables(Data).
 Identifiers: *World food, GOL model.

Detailed supply-distribution tables from the world grain-oilsseeds-livestock (GOL) projections model are presented. The projections to 1985 rest on a number of alternative assumptions about world economic growth, trade, and food policy conditions. Under most of the alternatives tested, the world has sufficient capacity--whether measured in terms of physical potential or economic feasibility--to meet the grain and overall food needs of an expanding, more affluent population at real prices

SELECTED APPROPRIATE TECHNOLOGIES

somewhat above base 1970 levels but below 1972-75 highs. However, the projections indicate that regional food distribution problems are likely to persist. Moreover, the alternative assuming lower grain yields and deteriorating climate and weather suggests the possibility of serious pressures on resources and higher prices for grain imports by developing countries. As a whole, the developing countries' grain imports are projected to increase faster than imports in the rest of the world; 1985 imports are projected to range from 49 million tons to 71 million tons.

PB-282 322/7 PC A05/MF A01
Iowa State Univ., Ames. Center for Agricultural and Rural Development.
Conceptualization and Quantification of a Water Supply Sector for a National Agricultural Analysis Model Involving Water Resources
Miscellaneous rept.

W. Arden Colette, Apr 76, 82p NSF/RA-761312
Grant AEN72-03389

Descriptors: *Agriculture, *Water consumption, *Water supply, Surface waters, Runoff, Water storage, Reservoirs, Ground water, Water distribution, Prices, Irrigation, Mathematical models, Linear programming, Tables(Data), Allocations.
Identifiers: Water management(Applied).

The availability of water for agricultural use is a major factor in determining agricultural production in the Western United States and in this area's contribution to national production levels. In this report the existing knowledge on water availability is compiled to develop a consistent and dependable set of water supply projections for the Western United States for 1985 and 2000. A chapter on surface water supplies includes natural runoff, reservoir storage, storage-rural runoff ratio, reservoir storage losses, maximum net flows obtainable, natural variability in precipitation and runoff, conveyance losses and net surface water supplies, and surface water transfers. Other topics discussed are ground water supplies, water prices, exogenous agricultural water requirements, non-agricultural water consumption, and legal restrictions. The water supply data presented can be used as a basis for analyzing the allocation and use of the nation's water resources.

PB-282 460/5 PC A03/MF A01
World Water Resources, Inc., Bethesda, Md.
Rural Potable Water Chlorination
William E. Hanford, Jr. and Alfred Long. 1970,
41p Rept no. WWRI/B-78/1
Sponsored in part by Agency for International Development, Washington, D.C. Office of Science and Technology.

Descriptors: *Rural areas, *Water treatment, *Developing countries, Chlorination, Purification, Maintenance, Gravity drainage, Chlorinators, Performance, Specifications.
Identifiers: Appropriate technology.

The paper addresses two questions: (1) What is the most desirable form of sanitizing chemical for use in rural water supplies; and (2) What is the best overall means of getting this sanitizing agent into rural water supplies. Several chemicals and hypochlorinators are described and evaluated. In conclusion, a low-cost, dependable feeding device suitable for use in disinfecting marginal waters in the rural areas of developing countries is presented. The operation and maintenance of this device is easy for the unskilled labor in these areas; no sophisticated power source is needed to provide continuous, automatic operation; the device uses a readily available, commercial chlorine chemical that can be economically shipped, stored, and used at these points of need. An appendix is also included giving technical specifications and performance data.

PB-282 708/7 PC A07/MF A01
Small Business Administration, Washington, D.C.
Office of Management Information and Training.
Financial Control by Time Absorption Analysis—A Tool for Profit Control
Cole D. Neff. 1975, 143p Rept no. SMALL BUSINESS MANAGEMENT SER-37

Descriptors: *Businesses, *Financial management, Control, Profits, Estimates, Losses, Prices, Manufacturing, Services.
Identifiers: *Small businesses.

Time-absorption analysis is a technique that can be used by all types of businesses for profit control. In this booklet, the author uses a step-by-step approach to introduce this concept and show the way for its adaptation to a particular business. The following topics are discussed: A step toward higher profits; Uses of the new method; General principles; Detailed procedure for the time-absorption method; Profit or loss estimation; Setting prices; Financial analysis of the business; Good financial control; Retail-wholesale business; Manufacturing; Service business; and Construction and contracting.

SAN/1220-1 PC A12/MF A01
General Electric Co., Philadelphia, Pa. Space Div.
Application of Solar Energy to the Supply of Hot Water for Textile Dyeing. Final Report, CDRL/PA 10
Sep 77, 265p
Contract EY-76-C-03-1220

Descriptors: *Solar process heat, *Solar water heaters, *Textile industry, Data acquisition, Design, Diagrams, Dyes, Economics, Energy consumption, Feasibility studies, Industrial plants, Medium vacuum, Performance, Planning, Sensible heat storage, Solar collectors, Specifications, Tanks, Textiles, Water.
Identifiers: ERDA/140905, *Process heat, Solar water heating, Hot water heating, Industries.

The design plan for a solar process hot water system for a textile dye beck at Riegel Textile Corporation's LaFrance, South Carolina, facilities is presented. The solar system consists of 396 GE model TC 100 evacuated tube collector modules arranged in a ground mounted array with a total collector area of 6680 square feet. The system includes an 8000-gallon hot water storage tank. Systems analyses, specification sheets, performance data, and an economic evaluation of the proposed system are presented. (ERA citation 03:021360)

SHR-0000101 PC A04/MF A01
National Association of Counties Research Foundation, Washington, D.C.
Rural Human Resources Project
Status Rept.
1974, 70p
Grant OEO-30094G-73-01
Executive Summary available from PROJECT SHARE, P.O. Box 2309, Rockville, Md. 20852 as SHR-0000101/ES.

Descriptors: *Social services, *Multistate government, State government, Relationship, Private organizations, National government, Methodology, Management, Local government, Integration, Coordination.
Identifiers: Counties, Alabama, Arkansas, Iowa, Minnesota, Montana, New York, Oregon, Pennsylvania, *Rural areas.

A quarterly progress report presented by the National Association of Counties Research Foundation provides descriptions of current activities of the Rural Human Resources Project, designed to help rural counties respond to the human services needs of their citizens. Participating in the project are the State association of counties in Alabama, Arkansas, Iowa, Minnesota, Montana, New York, Oregon, and Pennsylvania. Part One presents an overview of the eight-State project with emphasis on the development of closer ties between the State associations of counties and local community action agencies. Human services integration at the county level is discussed, together with a description of the roles played by the new staff position added by each State association -- human resources coordinator, and presents individual status reports for each participating State. These reports describe the conditions under which human services are delivered in each State, the principal objectives of each State's project, and current progress. Human resources coordinators for the project are listed by name and address.

SHR-0001658 PC A07/MF A01
Office of Human Development, Washington, D.C.
Office of Rural Development.
Getting Human Services to Rural People
Final Rept.
Jun 76, 147p Rept no. HEW/ORD/DC-76/06
Executive Summary available from PROJECT SHARE, P.O. Box 2309, Rockville, Md. 20852 as SHR-0001658/ES.

Descriptors: *Social services, *Rural areas, *Delivery, Services, Service related organizations, Regulations, Program financing, Position(Location), Population migrations, Planning, Outreach, Organizations, Organization theory, Operations, Methodology, Management, Management systems, Local government, Legislation, Integrated services, Input, Inadequacies, Government, Financing, Federal aid, Evaluation, Effectiveness, Coordination, Consumers, Constraints, Community relations, Communicating, Clients, Capacity, Capabilities, Agency role, Abilities.

The results of field evaluations of 11 rural human services projects are reported, barriers to the delivery and receipt of services in rural areas are identified, and implications for action by DHEW are discussed. The projects visited, nine of which received DHEW funds, operated within generally similar contexts: rural agricultural communities with dispersed populations and high levels of poverty. However, the projects varied considerably in the number and type of services provided and in the primary target groups served. A strongly constituted board of directors was found to be one good indicator of a strong project. Projects with broadly defined target groups and diverse goals appeared weaker than those with narrower target groups and well defined, integrated goals and objectives. All projects expended high levels of effort on obtaining funding. Recognition of the need for interagency cooperation was widespread. Planning and evaluation components were generally weak. Barriers to effective delivery of DHEW services in rural areas include transportation problems, lack of information about rural projects, limited flexible funding and staff capacity at the local area, and attitudinal problems, as exemplified in the common belief that DHEW's involvement in rural affairs is inappropriate. It is recommended that a long-range national strategy for rural development be established and that a commitment be made to providing dollar and manpower resources for overcoming imbalances between rural and urban America. Case studies are presented for 8 of the 11 projects visited.

SRO-888-1 PC A04/MF A01
Georgia Univ., Athens.
Multidisciplinary Research Program Directed Toward Utilization of Solar Energy Through Bioconversion of Renewable Resources. Progress Report
W. R. Finnerty, Jul 76, 73p
Contract E(38-1)-888

Descriptors: *Solar energy conversion, *Trees, Resins, Biosynthesis, Clone cells, Growth, Herbicides, Phenotype, Plant stems, Research programs.
Identifiers: ERDA/140504, ERDA/550400, ERDA/551000, ERDA/550200, ERDA/090100, Plants(Botany), Genetics.

Progress is reported in four research areas of solar bioconversion. The first program deals with the genetic selection of superior trees, physiological basis of vigor, tissue culture, haploid cell lines, and somatic hybridization. The second deals with the physiology of paraquat-induced oleoresin biogenesis. Separate abstracts were prepared for the other two program areas: biochemical basis of paraquat-induced oleoresin production in pines and biochemistry of methanogenesis. (ERA citation 02:000461)

TID-26786 PC A03/MF A01
Auburn Univ., Ala.
Potential for Conversion and Utilization of Solar Energy In Poultry Production. Progress Report Covering the Period from September 15, 1974 to January 31, 1975.
R. N. Brewer, and J. R. Dunn. 28 Jan 75, 34p

SELECTED APPROPRIATE TECHNOLOGIES

Descriptors: *Agriculture, *Energy demand, *Solar energy, Agriculture, Fowl, Production.
Identifiers: ERDA/140901.

For abstract, see NSA 7504

TID-26889 PC A04/MF A01
 Puerto Rico Nuclear Center, San Juan.
Evaluation of the Emery Dredge for Determining Numbers of Snails in Tropical Reservoirs.
 W. R. Jobin, and F. F. Ferguson. 1973, 56p

Descriptors: *Snails, *Abundance, *Pest control, *Planning, *Schistosomiasis, *Puerto rico, Populations, Sampling, Water reservoirs.
Identifiers: ERDA/520100.

Since control of the aquatic snails which transmit schistosomes can be very expensive in large hydroelectric and irrigation reservoirs, it is important to understand precisely the dynamics of these snail populations in order to plan efficient programs for their control. Thus sampling methods are needed to measure the numbers of snails in the reservoirs and this report concerns the use and evaluation of the Emery dredge in nine reservoirs in Puerto Rico. The results showed that the Emery dredge could be utilized under certain conditions to accurately estimate numbers of snails in these reservoirs. In addition field results showed that Biomphalaria glabrata could be stranded by water receding very slowly and that they were highly resistant to desiccation. These results are important for planning snail control through periodic fluctuation of the water level.

TID-27060 PC A02/MF A01
 Energy Research and Development Administration, Washington, D.C. Div. of Buildings and Industry.

State Research Priorities for Energy Conservation in Buildings and Agriculture

1975, 18p

Descriptors: *Energy conservation, *Meetings, Agriculture, Buildings, Economics, Fertilizers, Natural gas, Production, Reviews, Solar energy conversion, Synthetic fuels, Thermal insulation, US ERDA.
Identifiers: ERDA/320100, ERDA/320300.

Highlights are given of Federal and State presentations at a conference on research priorities for energy conservation in buildings and agriculture held in Chicago on Oct. 20, 1975. The conference was sponsored jointly by US ERDA and the National Governor's Conference. The five top priority categories recommended by the States for Federal R and D related to energy conservation in buildings were: insulation materials; technology transfer; economic factors; solar heating and cooling; and construction techniques. The top priority items recommended for research on energy conservation in agriculture were: development of substitute fuels for natural gas; improved fertilizer production processes; energy production from wastes; more efficient crop-drying techniques; and more efficient food- and fiber-processing methods. (ERA citation 01:023564)

TID-27164 PC A15/MF A01
 Cornell Univ., Ithaca, N.Y.
Bioconversion of Agricultural Wastes for Pollution Control and Energy Conservation. Final Report
 W. J. Jewell, H. R. Davis, W. W. Gunkel, D. J. Lathwell, and J. H. Martin, Jr. Sep 76, 341p
 Contract ERDA-NSF-741222A01

Descriptors: *Manures, *Methane, Air pollution, Anaerobic digestion, Biosynthesis, Economics, Energy conservation, Feasibility studies, Land pollution, Water pollution.
Identifiers: ERDA/090122, ERDA/140504, ERDA/295000, *Agricultural wastes, Air pollution control, Water pollution control.

The combination of concerns for energy shortages and pollution control has renewed interest in the possibility of generating energy from organic wastes. This report is a comprehensive study of the feasibility of generating a substitute natural gas

on U. S. dairies (40 and 100 cows) and beef feedlots (1000 head) using the anaerobic fermentation process. The feasibility in technical, economic and practical terms is estimated. Excluding energy use in manufacture of equipment and farm chemicals, the total energy use on 40 and 100 cow dairies, and 1000 head feedlots were estimated to be $164 \times 10 \exp 6$, $307 \times 10 \exp 6$, and $670 \times 10 \exp 6$ kcal per year, respectively. The estimated maximum annual methane energy that could be generated on these operations was estimated as $216 \times 10 \exp 6$, $473 \times 10 \exp 6$, and $2280 \times 10 \exp 6$ kcal, respectively. Thus, a dairy farm in northern New York could produce more energy than it consumes, and a feedlot could produce more than 3 times the quantity consumed. The estimated costs of generating methane on 40 and 100 cow dairies and on a 1000 head beef feedlot were \$22.80, \$13.40, and \$4.50 per $10 \exp 6$ kcal. Detailed analyses of the three operations estimated that the actual costs for utilization would increase to \$80, \$39, and \$11 per $10 \exp 6$ kcal for specific operations, respectively. Farms with more than 100 cows can begin to consider the technology as an income producing operation. It is therefore concluded that anaerobic fermentation of agricultural wastes has significant potential and should receive increased attention. (ERA citation 02:021947)

TID-27205 PC A03/MF A01
 Ohio State Univ., Columbus.
Leaf Decomposition in a Tropical Rainforest Stream
 D. E. Padgett. 1975, 48 Contract E(40-1)-GEN-33 Thesis.

Descriptors: *Forest litter, *Fungi, Aquatic ecosystems, Biochemical reaction kinetics, Decomposition, Ecology, Forests, Puerto rico, Streams, Tropical regions.
Identifiers: ERDA/520100, ERDA/550200, Aquatic microbiology, *Hyphomycetes.

Fungi play an important part in leaf litter decomposition in terrestrial ecosystems in both temperate and tropical regions. There are few published reports dealing with decomposition in running waters, and no work has been done in tropical streams. Results are reported from a study undertaken to determine the nature and time course of disappearance of submerged leaf litter in a small stream of a forest in northwestern Puerto Rico, with emphasis on elucidating decompositional activity of aquatic hyphomycetes. (ERA citation 02:018251)

TID-28044 PC A14/MF A01
 Energy Research and Development Administration, Washington, D.C.
Guide to Demonstrations of Energy Conservation, Solar Energy and Other New Technologies: Energy Extension Service
 N. Ignatius. Sep 77, 307p

Descriptors: *Agriculture, *Buildings, *Commercial buildings, *Energy conservation, *Geothermal energy, *Houses, *Industrial plants, *Process heat, *Solar cell arrays, *Solar cooling systems, *Solar heating systems, *Solar water heaters, *Wind power, *Manuals, Biomass, Demonstration programs, Farms, Greenhouses, Office buildings, Passive solar heating systems, Planning, Residential sector, School buildings, Solar air conditioning, Solar energy, Solar heating, Solar space heating, Underground, USA.
Identifiers: ERDA/299000, ERDA/291000, ERDA/320100, ERDA/140900, ERDA/140501, Subsurface structures.

This guide was compiled by the Energy Extension Service (EES) for use by State EES planners. It is intended to facilitate viewing of solar, conservation, and other energy technologies at work. The demonstrations listed in this Guide have generally been limited to those most applicable to individual homeowners, small businesses, schools, and farms. In a few states, however, municipal systems have also been included. Many of these projects have received Federal funding. The majority of projects demonstrate some form of solar energy. In addition to solar heating and cooling for homes and commercial buildings, a number of examples

of farm applications such as solar crop drying are listed, as well as demonstrations of wind energy, biomass, photovoltaics, etc. Since all successful solar heating and cooling systems incorporate sensible energy-conserving design, each solar heating and/or cooling project is at the same time an energy-conservation project. When these conservation designs are of special interest or inventiveness, this has been noted. In a few cases, projects demonstrate only conservation measures, such as the construction of buildings underground. (ERA citation 03:018509)

TT-67-51301 PC A04 MF A01
 National Science Foundation, DC. Special Foreign Currency Science Information Program.
Importance of Trace Elements in Chernozem Soils under Conditions of Dry Farming, and Their Influence on the Physiological Processes Determining the Drought-and Heat-Resistance of Plants.
 M. Ya. Shkolnik, and N. A. Makarova. 1968, 54p Rept no. SFCS1-Agr(TT-67-51301)
 Trans. of Akademiya Nauk SSSR. Botanicheskii Institut. Trudy: Seriya IV, Eksperimental'naya Botanika, n12 p23-73 1958.

Descriptors: *Agriculture, Fertilizers, *Soils, USSR, Biochemistry, Tracer studies, Soil mechanics, Boron, Moisture, Cereals, Potatoes, Rural areas.
Identifiers: Chernozem soils.

The present work consists of two sections: the first presents the data of our investigations of the influence of trace elements on the yield and the chemical composition of plants on chernozem soils under dry-farming; the second section deals with the influence of trace elements on the physiological processes determining the drought-resistance of plants. (Author)

TT-67-58007/2 PC A05
 National Science Foundation, Washington, D. C. Special Foreign Currency Science Information Program.
Contemporary Agriculture, Vol. 14, No. 2, 1966.
 1967, 82p Rept no. SFCS1-Agr(TT-67-58007/2)
 Trans. of Savremena Poljoprivreda (Yugoslavia) v14 n2 1966. The above journal is translated cover-to-cover.

Descriptors: *Agriculture, Yugoslavia, Wheat, Vegetables, Corn, Fruits, Climatology, Herbicides, Fungicides, Bovines, Rural areas.

Contents: Restoration of Deschampsietum grasslands by using different herbicides; The effect of lodging on the yield and quality of winter wheat; The effect of climatic factors on the length of the growing period and possibilities of planning the ripening dates of peas; The influence of the number of plants and their spacing in consociated corn-wheat crops on some quantitative characteristics of Indian corn; The possibility of rapid regeneration of tall grape vines to achieve satisfactory yields; Control of apple powdery mildew by means of modern fungicides; Results of testing the resistance of some Yugoslav and imported inbred lines to the European corn borer; Studies in the breeding value of imported red-and-white Simmental cattle at the 'Srem' farm; Test of the two-machine system of beet digging at the 'Beograd' farm; Methods of simplifying the handling of data in tests with corn.

TT-68-50342 PC A16 MF A01
 National Science Foundation, Washington, D. C. Special Foreign Currency Science Information Program.
Woodworking in Estonia: Historical Survey.
 A. Viires. 1969, 352p* Rept no. SFCS1-Smi(TT-68-50342)
 Trans. of mono. Eesti Rahvaparane Puutoondus. Ajalooline Ulevaade, Tallinn, 1960 333p, by J. Leavit.

Descriptors: *Wood, Material forming, *Culture, USSR, Rural areas, Trees, Small tools, Containers, Bending, Vehicle chassis components, Roofs, Joining, Anthropology, Economics.

Identifiers: Social anthropology, Estonia, Woodworking, Turning(Woodworking), Handicrafts, Furniture.

The document considers the importance of home industry with particular reference to woodworking, in Estonian village economy.

TT-58-50363 PC A08 MF A01
National Science Foundation, Washington, D. C.
Special Foreign Currency Science Information Program.

Sown Winter Ranges in the Foothill Deserts of Soviet Central Asia.

N. T. Nechaeva, and S. Ya. Prikhodko. 1968, 167p Rept no. SFCS-1-Agr(TT-68-50363)

Trans. of mono. Iskusstvennye Zimne Pastbishcha v Predgornykh Pustynakh Srednei Azii. (Opty Sozdaniya Iskusstvennykh Fitotsenozov), Ashkhabad, 1966 227p, by R. Karschon.

Descriptors: *Agriculture, USSR, Deserts, Rural areas, Plants(Botany), Ecology, Economics.

Identifiers: Area planning and development.

This book summarizes experimental work toward establishing perennial winter ranges of shrubs and half-shrubs in the foothill desert. The work deals with the dynamics of the formation of phytocenoses, their life-span, processes of regeneration and competition, and environmental effects. (Author)

TT-70-57149 PC A11 MF A01
National Science Foundation, Washington, D.C.
Special Foreign Currency Science Information Program.

Fundamental Trends in the Evolution of Relations between Employers, Workers and Governments in Africa (Tendances Fondamentales de l'Evolution des Relations entre Employeurs, Travailleurs et Gouvernements en Afrique)

Charles Bokonga. 1971, 232p Rept no. SFCS-Lab(TT-70-57149)

Contract NSF-C466

Trans. of Annales de droit et de Sciences Politiques (Belgium) n23 186p 1967.

Descriptors: *Industrial relations, *Africa, *Labor relations, Developing countries, Labor unions, Organizations, Professional personnel, Government policies, Interactions, Management, Personnel, Surveys, France.
Identifiers: Translations, Employers, Employees.

A panoramic survey is made of the fundamental tendencies prevailing in the relations between employers, workers, and public authorities in the African countries which have just attained independence. There would appear to be not so much a question of bettering the standard of the working class, a rather privileged class as compared to the entire population, as of bringing officials, political leaders and some entrepreneurs, to preoccupy themselves with the masses. The role of the trade unions is not reduced in this new context. (Author)

TT-70-57224 PC A15/MF A01
Forest Service, Washington, D.C.

Interaction of Wood Species in Different Types of Forests

D. D. Lavrenko. 1972, 339p
Trans. of mono. Vzyamodeistvie Drevesnykh Porod v Razlichnykh Tipakh Lesa, Moscow, 1965. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Forest land, *Forest trees, *Wood, Cultivation, Economic development, Rotation, Plant growth, Interactions, Soil properties, Mixtures, Acclimatization, Plant genetics, Management, Pine trees, Oak trees, Hardwoods, Translations, USSR, Topology, Handbooks.
Identifiers: Silviculture, Forest management, Forest plantations.

The book incorporates theoretical principles of the interaction of wood species in different types of forests and makes recommendations on cultivating high productive plantations of economically important species. The following aspects have been

dealt with in this work: studies on the interaction of wood species, trials in forest-steppes for developing stable plantations, typological investigations, aspects of rotation of species, and the problems of intraspecies and interspecies relationships. The author examines the relation of wood species with the environmental conditions, especially with the soil conditions, establishes the competitive indices of wood plants and proves the advantage of mixed plantations over pure plantations. The author also deals with the methods of investigation and the ways of controlling the interactions of the wood species.

TT-73-54014 PC A19

Department of Agriculture, Washington, D.C.

The Structure of Yarn

Witold Zurek. 1975, 430p

Trans. of mono. Struktura Przedzy, Warsaw, 1971 436p, by Michal Zaorski. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Yarns, *Books, Microstructure, Physical properties, Numerical analysis, Fibers, Textile processes, Spinning, Cotton fibers, Silk, Rayon, Synthetic fibers, Translations, Poland.

The book contains physical (A) and mathematical (B) tables. Tables of the A group (physical) are meant to help designers at the selection of fibers for an intended end use. After some conclusions have been drawn with regard to the magnitude of particular characteristics (strength, or elongation of yarn), final calculations are made with the use of data referring to definite materials. Tables of the B group (mathematical) allow to determine quickly and accurately the auxiliary values (twist factor, C,D as well as z parameter necessary for calculation of strength), which are used at an appraisal of physical properties of yarn.

UCLA-12-1123 PC A02/MF A01

California Univ., Los Angeles. Lab. of Nuclear Medicine and Radiation Biology.

Challenge of a Desert: Revegetation of Disturbed Desert Lands

A. Wallace, E. M. Romney, and R. B. Hunter. 1977, 23p Rept no. CONF-770369-1

Contract EY-76-C-03-0012

NAEG Pu program report meeting, Las Vegas, Nevada, USA, 2 Mar 1977.

Descriptors: *Deserts, *Revegetation, *Arid lands, Biological adaptation, Climates, Economics, Genetic variability, Germination, Moisture, Plant growth, Plants, Productivity, Seeds, Terrestrial ecosystems.

Identifiers: ERDA/510100, Shrubs, Irrigation, Trees(Plants), Grasses.

The revegetation of disturbed, arid lands is one of the great challenges of a desert. It is not an impossible task, however, if one utilizes and properly manages both the natural and the man-made resources available. Through better understanding of the processes governing revegetation and the ability to control them, it is possible for man to more rapidly restore disturbed desert lands. Rain manipulation to form moisture catchment basins, selection of seed from pioneering shrub species, preservation of existing shrub clump fertile islands in the soil, supplemental fertilization and irrigation, and transplanting vigorous shrub species are some of the important things that can be done to help restore disturbed desert land. Some of the costs can be off-set by restoring the land to economically important trees and shrubs, or grasses, instead of back to the original vegetation. Thousands of years of historical evidence of man's survival on arid lands attest to success in meeting the challenge of the desert. (41 references). (ERA citation 03:001379)

UCRL-Trans-11099 PC A02/MF A01

Study and Development of Efficient Systems for Extracting and Utilizing the Heat That Accumulates in the Deep Layers of the Earth's Crust in the Far North and Northeast of the USSR

Yu. D. Dyad'kin, Yu. M. Pariskii, A. B. Vainblat, and V. A. Romanov. 1973, 16p

Contract W-7405-Eng-48

Translated from pp 43-51 of Izuchenie i ispol'zovanie glubinnogo tepla zemli, Izdat'stvo Nauka, Moscow, 1973.

Descriptors: *Hot-dry-rock systems, *USSR, *Geothermal resources, Economic development, Heat extraction, Mining, Thermal waters, Uses.
Identifiers: ERDA/150102, ERDA/150906, ERDA/151000, Translations.

The problems of accelerated economical development of the Far North and Northeast regions of the USSR in general and the further development of the mining industry in particular require the solution to the problem of supplying warm water to industrial and residential areas. Variations of the terrestrial heat extraction circulation systems designed to meet the technological needs of the mining industry are discussed. As an illustration of the effectiveness of utilization of terrestrial heat in this industry, the results of calculations of technical and economic indices of needle hydrothawing of frozen rocks with and without preheating of the water in the circulation system are given. (ERA citation 02:016223)

UCRL-79515

PC A02/MF A01

California Univ., Livermore. Lawrence Livermore Lab.

Early Impact of Solar Energy Through Industrial Applications

R. C. Maninger. 23 Jun 77, 16p Rept no. CONF-770707-1

Contract W-7405-ENG-48

Western plant engineering conference and show, Anaheim, California, United States of America (USA), 13 Jul 1977.

Descriptors: *Solar energy, Commercialization, Information, Technology transfer.

Identifiers: ERDA/140000, Research management.

The Energy Research and Development Administration (ERDA) has established a Solar Technology Transfer Program (STTP) as an important part of the ERDA mission to promote rapid and widespread commercialization of solar energy. This program is an innovative approach to technology transfer through information dissemination and training in solar energy. This is done by means of an integrated network of regional technology agents who interact directly with multiplier groups in both the public and private sectors. Details of the program and ways of industrial participation in it are described. (ERA citation 02:051156)

UMD-4908-8

PC A02/MF A01

Maryland Univ., College Park. CCMS Project Office.

CCMS Solar Energy Pilot Study. Solar Heating and Cooling Systems in Buildings. Report to the CCMS Plenary, Dusseldorf, Federal Republic of Germany, February 8-9, 1977

1977, 10p

Contract EY-76-S-05-4908

Descriptors: *Solar air conditioning, *Solar space heating, *Meetings, Buildings, Demonstration programs, Information, International cooperation, Solar cooling systems, Solar heating systems, Technology transfer.
Identifiers: ERDA/140901.

The Solar Energy Pilot Study's "Report to the CCMS Fall Plenary" in October 1976, contained a detailed account of the annual meeting which had been held shortly before (September 1976) in Copenhagen. That report contained summaries of national solar heating and cooling programs and projects; information on the first reports prepared according to the CCMS System Reporting Format and future similar reports, on the exchange of documents among participating countries, on the formation of a new Mediterranean Climate Applications Group; and additional details on highlights of the meeting and other pilot study activities. Several major accomplishments are briefly reviewed. (ERA citation 02:056100)

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The Agency for International Development has established a fund to purchase NTIS documents for organizations working to help low-income groups in Latin America through the application of Appropriate Technology. To request documents, complete this form and return it to:

Paul Bundick, NTIS
425 13th Street, N.W. - Suite 620
Washington, D.C. 20004

REQUESTING ORGANIZATION

NAME _____
ADDRESS _____

ORGANIZATION'S PURPOSE

(State explicitly how the organization works with low-income groups.)

PLEASE TELL US ABOUT YOUR PROJECT

What will it achieve? _____

Who is performing the technical assistance? _____

Who are the beneficiaries? (End-users and/or groups to be served)

DOCUMENTS REQUESTED

ORDER NUMBER	TITLE	QUANTITY*

* If microfiche is requested, please note.



TECHNICAL INFORMATION NETWORK ORDER FORM



Your Ref _____ Date _____

Date _____

Please ship me the reports listed below. Payment for the total cost of this order is by:

- Check drawn on U.S. bank, payable to NTIS. UNESCO coupons enclosed.
 Charge to my NTIS deposit account no. _____ International Money Order.

American Express Card Holders Only

- Charge to my American Express Card account number

Signature

Expiration Date

Name _____

Organization _____

Address _____

City, Country _____

* All Prices Subject to Change

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